

# The National Geographic Magazine

AN ILLUSTRATED MONTHLY

## KLONDIKE NUMBER



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# THE National Geographic Magazine

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## THE NORTHWEST PASSES TO THE YUKON

By RALPH ROHAMANT SCHENCK

While Vancouver's ships lay at anchor in July, 1794, in his Port Frederick, the Kautokton of the natives and the Hoonah post-office of today, at the northwest end of Chichagof Island, Messrs Whidby and Lencoeur, in a small boat, followed the north shore of Ley straits and penetrated the long Lynn canal, bringing back reports that ended Vancouver's hope and search for a northwest passage through from the Atlantic—De Fuca's straits and Del Fonte's river myths and dreams of "hypothetical projectors" and "closet navigators," as this greatest of surveyors and explorers bitterly termed them.

Whidby's men rowed up that finest fiord of all that landscape coast to Point Seduction, so named because of the "exceedingly artful character" of the natives, who met them at that point and lured them further on up the western arm (Chilkat inlet) to the mouth of the river, just beyond the modern Pyramid Harbor.

These artful natives had then enjoyed trade with white men, and the Chilkats and Chilkoots, really one tribe and closely related, were not only the greatest warriors and boldest buccanniers of the coast, but were great "grease-traders" and middle-men as well. Two "grease trails" led away from the two inlets across the range to the game country beyond, where the milder plains people, the "Suck" or Tlinah tribes of Athabaskan stock, were content to trap and trade at great disadvantage, exchanging their pelts and horns for the fish oil and sea products of the coast tribes and the goods which the latter obtained from white traders. Russian, "Boston," and Hudson's Bay Company traders realized



CHIEF OF PASS — COLORED ATTACHED TO PHOTO, 1897

From a Photograph by E. S. Carter

more than one hundred per cent profit on the goods they gave the Chilkats in exchange for furs, and the Chilkats realized a still greater profit when they dealt with the Tinnchs.

For the half century that the H. B. Co.'s ships regularly visited Chilkat inlet the traders never dealt directly with the Tinnchs. The Chilkats were relentless monopolists, meeting the Tinnchs at established camping grounds, at Tagish houses, and other points beyond the range each year, and packing the furs back over the Chilkat or the Shaseki (Chilkoot) pass. Occasionally they brought a Tinnch chief down under escort as a great reward and honor, to allow him to look at the fire-ship of the white traders. Mr Robert Campbell, of the H. B. Co., who crossed from the Mackenzie river to the Pelly in 1842-'48, wrote: "The rascally Chilkat Indians from the Pacific coast were in the habit of making trading excursions to Pelly. They ascended by Lynn canal, thence crossed over the mountains to the head of Lewes river. Descending this river they came to the Pelly, where oftentimes, when strong enough, they pillaged and massacred the Pelly Indians, than whom there could be no more honest men."

In 1849 the H. B. Co. built Fort Selkirk, at the junction of the Lewes river and the Pelly, buying furs directly from the Tinnchs and sending them out by the chain of H. B. Co. forts connecting with the Mackenzie river and Hudson bay. The difficulty of getting supplies into Fort Selkirk had induced the H. B. Co. to consider abandoning it, when the Chilkat chief, incensed at this interference with his fur trade, led a war party across the mountains and plundered and burned the fort. The blockade of the passes was more strictly maintained than ever against Tinnchs and whites.

The first white man to cross the range, according to local Chilkat and common Alaskan tradition, is said to have been a red-headed Scotchman in the employ of the H. B. Co., who, reaching the ruins of Fort Selkirk in 1864, started alone over the old "graze-trail" to the sea. He hid from Indians all the way, but was captured near the coast and held until ransomed by Capt. Swanson, of the H. B. Co.'s *Labouchere*, on its regular visit to Pyramid Harbor. Because of his red hair he was regarded as a shaman and treated with distinction during his stay. Dr Dawson discredits this story of the Scotch pioneer, as Fort Selkirk was in ruins at that time, and he believes the whole story arises from the fact that certain articles belonging to the traders at Fort Selkirk were brought to the trading ship on the coast.



Prof. George C. Davidson, who had visited the Chilkat country in 1857, when making a scientific reconnaissance of Russian America for Secretary Seward, returned in 1863 to observe the eclipse of the sun, August 7, establishing his station and observatory at the upper Chilkat village, where he was the guest of the great chief Chatchish, Kloh-Kutz, or Hole-in-the-Clark, as that head of the Cinnamon Bear clan was variously known. Secretary Seward and his party were escorted up the Chilkat river in Kloh-Kutz's war canoe on eclipse day, and, joining Prof. Davidson for another day, carried away the astronomer and his instruments before there was time for him to make an intended trip toward the pass. During his stay Prof. Davidson had induced Kloh-Kutz and his wife to draw a very intelligible map of the route up the river to the Chilkat pass and across to Fort Selkirk, a route Kloh-Kutz had traversed since childhood, and which his father had traversed as one of the war party which burned Fort Selkirk. Lying face downward, the old chief and his wife discussed and laboriously drew on the back of an old chart the lines of all the water-courses and lakes, with the profile of the mountains as they appear on either hand from the trail. The great glacier is indicated by snow-shoe tracks to show the mode of progress, and the limit of each of the fourteen days' journey across to Fort Selkirk is marked by cross-lines on this original Chilkat map, which is still in the possession of Prof. Davidson, at San Francisco. There is a copy (Topographical Sheet No. 2268) at the U. S. Coast and Geodetic Survey office at Washington, and this Kloh-Kutz map was the basis of the first charts.

George Holt, a miner, claimed to have crossed the eastern, the Chilkoot, or Shaseki pass in 1872, and descending as far as Lake Marsh, returned by way of the Teslin to the headwaters of the Stikine, following in reverse a part of the route of Michael Byrnes, of the W. U. T. Co. survey, who came up from the Stikine region to the Teslin and Tagish lake in 1867. Holt crossed the pass again in 1874, and descended the Yukon to the portage connecting with the Kuskokwim.

In 1877 Lieut. C. E. S. Wood, U. S. A., undertook independent explorations in Alaska. Mutiny of his canoe-men prevented his reaching Mt. St. Elias, which he wished to climb, but he visited Taylor and Glacier bays on Cross sound, camped and hunted mountain goats around Geikie and Muir inlets, and crossed from the Muir glacier to Lynn canal. He spent some time with the Chilkats and Chilkoots, but neither Kloh-Kutz nor Deniwak.



CLIMBING ABOVE-THE-ROCKS IN THE MOUNTAIN A. 100  
From a Photograph by J. A. Curtis

the one-eyed tyrant of the Chilkoot village, would let him cross the mountains, which they pictured as full of dangers, although Lieut. Wood was fortified with messages, gifts, and tokens from Doniwak's sister, the wife of Sika Jack. An account of his stay, "Among the Thlinkets in Alaska," was published in *The Century* magazine July, 1882.

In 1878 Doniwak peremptorily refused entrance to the prospectors Rath and Bean, but is said to have permitted George Holt to go as far as Fort Selkirk and return under guard.

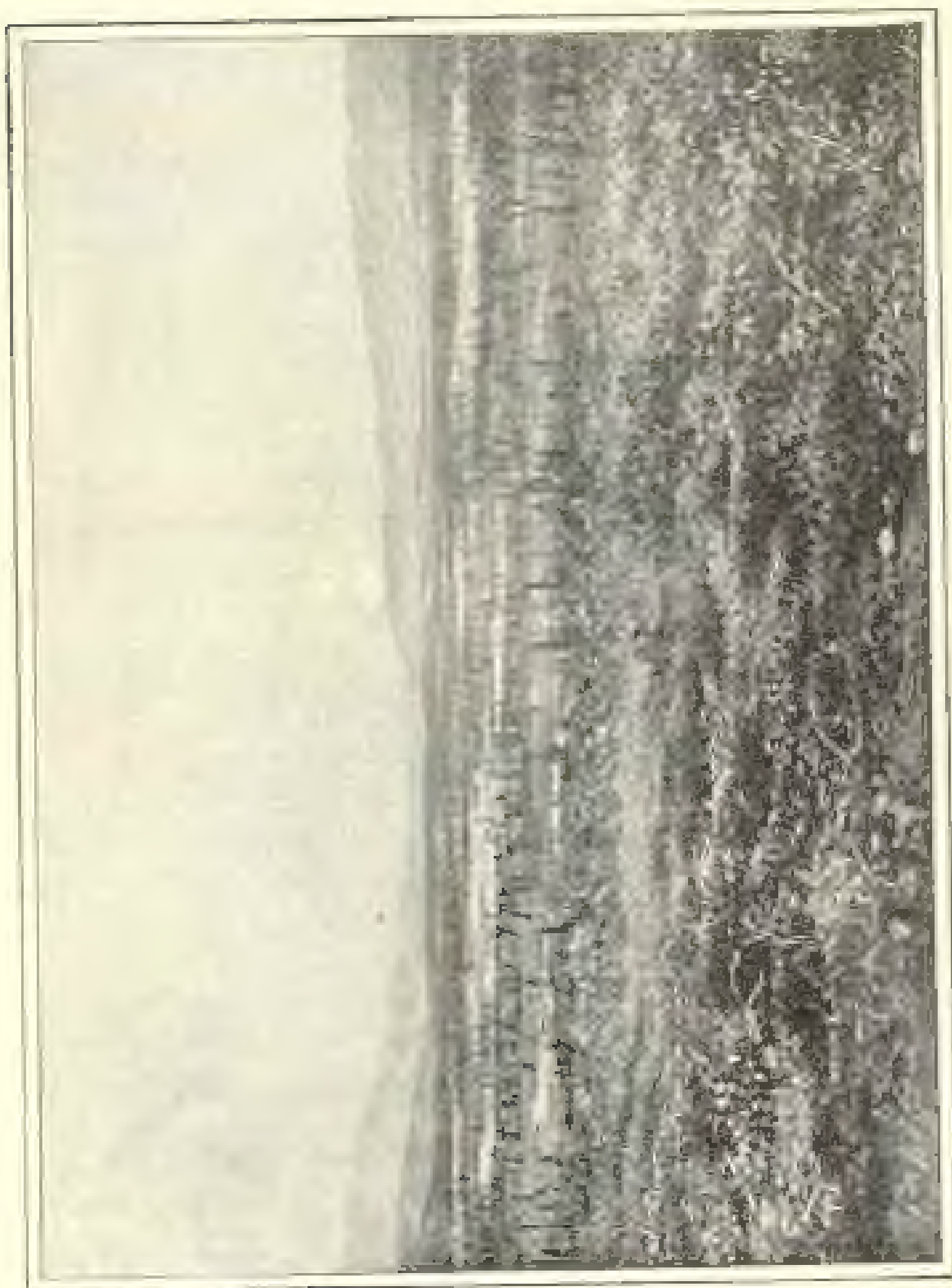
In 1880 the same Edmund Bean, with a party of nineteen miners, were placed under the special protection of Kook-Kutz, through the active interest and clever diplomacy of Capt. L. A. Beardslee, U. S. N., and guided across the passes, after giving assurances that they would not interfere with the fur trade. A trader shipwrecked in the wake of the prospectors, but being detected, was brought back and his life saved by Capt. Beardslee's earnest interference. As these miners went in, they met James Wynn (now of Juneau) coming out, and from him received warning of the dangerous rapids in the river beyond the lakes. Wynn has assured me that he had previously crossed the pass in 1872.

Forty-five miners crossed the pass in the spring of 1882 and returned in the autumn, and the Indians, finding that the packing of miners' supplies was more remunerative than the diminishing fur-trade, virtually raised the blockade and established an exorbitant tariff for transportation.

The Doctors Krause, of the Geographical Societies of Berlin and Bremen, spent the year 1882 and the succeeding winter at Pyramid Harbor and in the Chilkat villages, making the ethnographic studies published in the volume *Die Thlinket Indianer* and in collecting for their museum. Kook-Kutz was, as usual, the patron and protector of scientists, and assisted in their exploration and survey of the Chilkat river and its branches, the Chilkat pass, and the country beyond as far as the great lake named Lake Arsell in 1880. The Drs. Krause's maps of this region were published by the Berlin and Bremen Geographical Societies in 1883.

In 1883 Lieut. Frederick Schwatka, U. S. A., crossed by the miners' usual trail the eastern Chilkoot, or Shasseli pass, renamed it the Porrier pass, and lifted his way down the Yukon to the sea. The miners who went in in 1883 went back for provisions and spent the winter on the upper Yukon.





THE GREAT VALLEY RIVER, ABOVE THE MOUNTAIN PASS

By action of Mr. H. H. H. H.

In 1884 Dr Everett, U. S. A., crossed the Chilkat pass along the Kruse route, intending to explore westward and descend the Copper river, cooperating with Lieut. Abercrombie, who attempted the exploration of Copper river from its mouth; but neither plan was followed to completion. When Lieut. H. T. Allen explored the Copper river in 1885, his party ascended to the headwaters, crossed the divide to the Tanana, and descended that stream to the Yukon.

In 1890 Mr E. J. Glave, leading an expedition sent out by the *Frank Leslie's Weekly* newspaper, followed the Doctor Kruse's route to the Alek basin, went northward and returning descended the Alek to the ocean at Dry Bay. In 1891 Mr Glave proved his claim that pack horses could be taken over the range and could find sufficient pasturage in the bush country beyond. His "Pioneer Pack-horses in Alaska," published in *The Century* magazine, September and October, 1892, describes his route across to Lake Arkell, a route now known as the Dalton trail—Jack Dalton having been his assistant in the experiment with pack-horses.

The existence of a lower pass still further east, to be reached by an easy trail from Skagway creek, was reported to Mr William Ogilvie during his survey of 1887, and Capt. Moore of his party was detailed to explore it. He determined the altitude of the pass as 2,400 feet above sea-level, and named it in honor of Hon. Thomas White, Canadian Minister of the Interior. It was at once seen that White pass most easily allowed a wagon road to be constructed across to Lake Bennett—a distance of 47 miles and a rise of 2,400 feet, in contrast to the distance of 27 miles and a rise of 3,500 feet on the Chilkoot, Shuski, or Ferrier pass, again named as the Dyea pass by Mr Ogilvie.

The passes to the Yukon basin from Talca Inlet and river were known to H. B. Co. traders and the W. U. T. Co. surveyors, but were first definitely exploited as a route to the Yukon mining regions by the expedition of Lieut. Schwatka, U. S. A., and Dr C. Willard Hayes, of the U. S. Geological Survey, in 1891. They followed the north fork of the Taku river and crossed to Lake Teslin, where they launched canvas boats and proceeded without interruption to Fort Selkirk. The river connecting Lake Teslin with the Laras—known to the Indians as Teslin-too, and as the Hootahquun or "Hoody-link" to the miners—was marked on the Coast Survey chart at the time as the Nas-a-thane, or "no salmon," and was renamed the Newberry river by Lieut. Schwatka.

## OVERLAND ROUTES TO THE KLONDIKE

by HAMMIS GARLAND

I have been to the Yukon, and have seen the country from Dawson City to the mouth of the river. It is a beautiful country, and the scenery is of a grand and sublime character. In summer it shows all one could wish for, as an Irishman might say. The mountains are covered with snow, and the valleys are green. The river is full of fish, and the Indians are busy catching them. The country is very fertile, and the soil is rich. The climate is very healthy, and the air is pure. The people are very friendly, and the country is very beautiful.

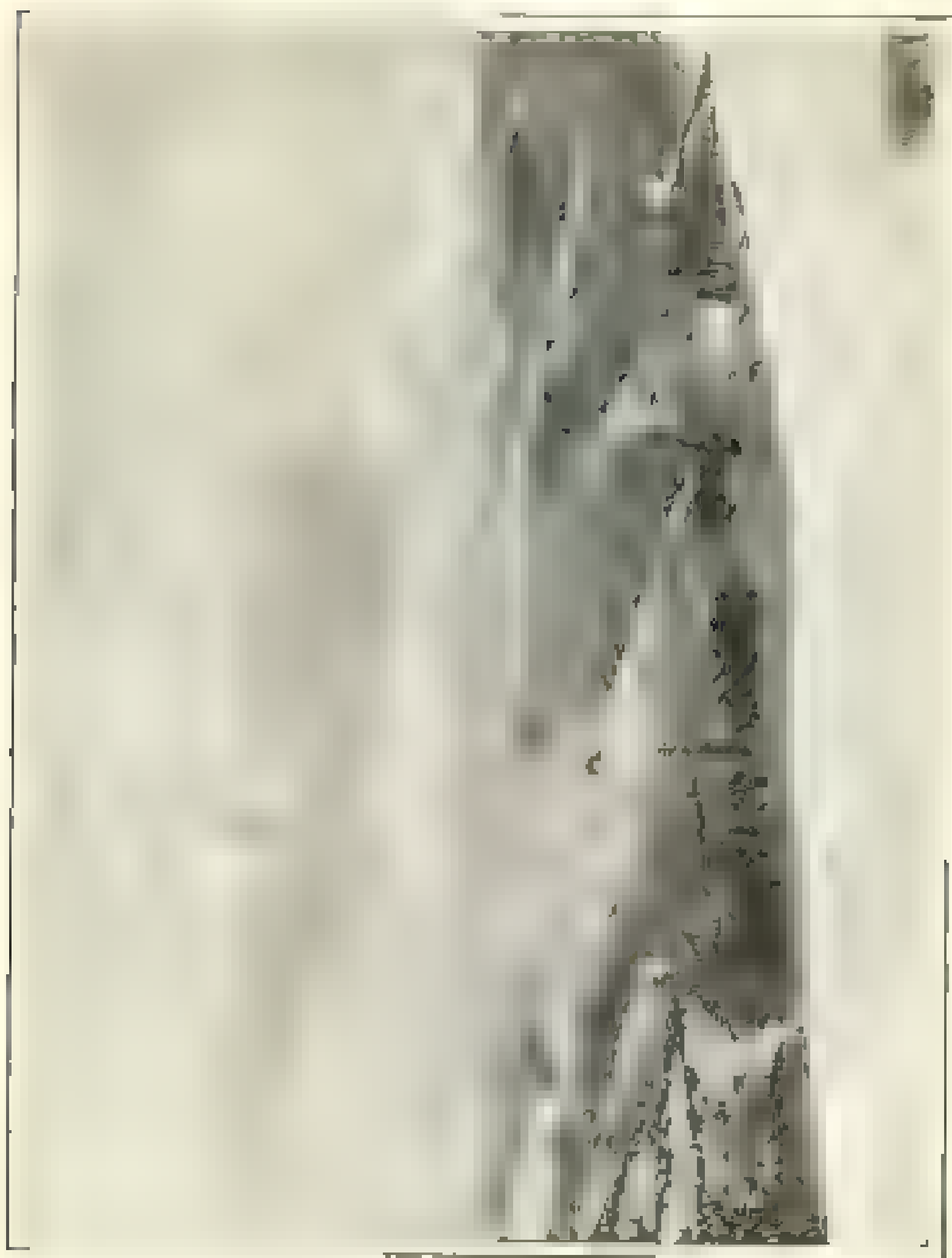
There is little game, and not many fish. There never was a large number of fish in the river, and the Indians are busy catching them. The country is very fertile, and the soil is rich. The climate is very healthy, and the air is pure. The people are very friendly, and the country is very beautiful.

I have been to the Yukon, and have seen the country from Dawson City to the mouth of the river. The features of the Arctic zone are realized. The ice does not go out of the river, even at Dawson, till late in May or June, and the river closes early in September.

Having decided that he was going to take the risk involved in attempting this great enterprise, the author first decided on his route.

the country. Of the overland, there are at present three—the Yukon route and Peace River route, the "Old Teanagh Trail," and the Kaskapov inland route. The Yukon route starts at Fairbanks, a small town at the end of a northern spur of the Canadian Pacific Railway, and proceeds by way of Lake Inland, Lake to Peace river, thence across the river into the valley of the Stikine river to Telegraph Creek and Teslin lake, which is the headwaters of the Yukon. This route is a very long one, and

the author has been to the Yukon, and has seen the country from Dawson City to the mouth of the river. The features of the Arctic zone are realized. The ice does not go out of the river, even at Dawson, till late in May or June, and the river closes early in September.



sixty days to go from Edmonton to Teslin lake. The cut route of Edmonton are using all means to make this route easy and safe. It can not be safely used before the middle of May. Pack horses are plentiful, and feed is good from May 15 to November.

The service of overland route, the "C.P. Telegraph Trail," begins at Athabasca, a small village on the Canadian Pacific Railroad, and follows the Fraser river over an excellent stage route established by the Canadian government to the little town of Hazelton, 220 miles north. Good stopping-places are found along the route. There are no bad lands, and the trail far is to the west end, passing over a very level country with good grass, road or foot Fraser, on Fraser lake, 125 miles from Hazelton. Port Fraser is a Hudson Bay post and trading store, with two miles to run at a speed of six miles of 10 tons, quite well equipped, and on near. A limited amount of supplies will be available here. Up to this point the trail is quite level, and though there are numerous creeks none are deep or hard to pass. The three rivers, the Bulkwater, the Muir, and the Nahcho can be forded except in high water when rafts will have to be used and even on a paddle canoe. Summer of course is very warm. Many trails cross the route and it will be necessary to have a compass, gun, or other means of defence should be taken to mark the main trail. There are

places where food for the horses can be found in autumn.

Beyond Port Fraser the next stopping point is Stuart, a rather fine post, with three or four whites and eight or ten Indians. The Indians, who live on the coast, make their own supply of food, being a trapping post. From Port Fraser, Hazelton is probably 125 miles. The route from Hazelton to Hazelton can be made by pack animals, and will take from sixteen to twenty days. Hazelton has a small population of prospectors with wives and a neighborhood. A Hudson Bay post, a few Indians and a couple of stores are all that are to be found here, and only about 25 miles to the next stage at Hazelton. The goods are brought by a Hudson Bay boat on the Skeena river, or by high water.

From here there is a route 200 miles to Telegraph Creek. The trail has been traveled for thirty-five years, and the government has spent thousands of dollars to keep it in first-class condition. It will probably take about ten days to cover this distance, as is a full order that the government is making Hazelton. There are two large stores at Telegraph Creek at present and undoubtedly a small town will immediately spring up there. From Telegraph



creek over to Teslin lake the trail will be opened and by the Canadian government. A wagon road will be constructed and as it has already passed the House of Commons granting subsidies for a railway. The road at present is estimated to be about 100 miles long and can be traversed in ten days or less. The way is wooded and has no dangerous features. At Teslin

and the rest of the journey made by water.

The Ashcroft trail and the Kaskapovs route, which is practically the same in character, is an arduous. It begins on a geological divide between the coast range and a spur of the Rocky mountains and is therefore somewhat like western Washington in temperature and rainfall. After leaving Quesnel the trail plunges at once into the wild country, and to those who are

not properly treated will be a source of need in case of necessity.

The advantages of this route are offset, however, by obvious disadvantages. It is very long. According to the most liberal estimates it will take forty days from Quesnel to Telegraph creek, though it can possibly be done in less time, provided there are no delays for bridge building. It will be possible to lighten it, sending part of the outfit by way of Victoria to Telegraph creek and by leaving an advance party for supplies with the Indians. A supply company to be delivered on a certain date from the stores at Hazelton.

It will not do to leave Quesnel until the grass comes up by the end of May. Before then there, even though it might be possible to find some water and water it would be difficult. After the end of May the Ashcroft trail will be a comparatively easy access route to the Cassiar and Teslin lake ranges, with no delays and very little toll to pay.

It is a matter of consulting the probable that Kaskapovs Ashcroft, and Quesnel can be made to furnish complete outfits for a hundred or more of pack trains, and being open the same route the way, supplies in case of need could be hurried forward by freight from Victoria, Vancouver or Winnipeg.

It is safe to count on about fifty days time from Ashcroft and where the expense will be light, probably not exceeding

in fuel or water reach at Teslin lake

## THE FUTURE OF THE YUKON GOLDFIELDS

By WILLIAM H. DALL,

*Geologist and Geographer.*

The conditions likely to prevail in the near future at the  
Yukon goldfields are as follows:

1st. A considerable number of the miners, therefore, be used

It is well to consider among those who come and expatriate  
in the region for the most part, request for the welfare  
of gold-seekers as a rather striking feature of the present  
condition. Many of the miners, however, may reach  
the Yukon by the coast route, and the cost of food, fuel, and  
other probable supplies, and the heavy clothing necessary for pro-  
tection against exceptional cold or other temperatures will be  
greatly increased. No man can carry his own provisions and  
equipment without assistance. Even for dogs, the least convenient  
drugs and oils, the necessary food will take up a considerable  
proportion of their load. It is impossible to accept to transport  
the necessities of life for thousands of people by the means  
at present open.

A considerable number of people are present  
in the Yukon at present. Few have estimated the number de-  
scribed of people in the present season as low as 5000.  
Should anything like that number be needed, including the Yukon  
during the next six months, it means that the transportation over-  
haul of the past season must be increased tenfold. A certain  
proportion must be allowed for waste, losses, and transporta-  
tion reaching the last mile or the excess in need beyond

The number of trips to Dawson, for a full season, made in  
1897 by steamers now on the river was very small. While  
we could not see how the two trips per season can be made  
by a capable vessel, it is safe to reckon not more than one.  
For 50,000 people seasonally trips would have to be made in order  
to counteract the possibility of starvation, which has stared so  
many in the face under present conditions. This provides not  
for criminals, not for necessary furniture, tools, and many many  
amenities or improvements, nor as they exist but merely to pre-



Let us assume two loads for each of the old Canadian steamers or, say, twenty-five loads, and one trip each for to and from each steamer. This total amounts to thirty-four loads, or less than an Alaskan is required to keep the nestlings fed at peak population on a half-to-starvation basis during the winter of 1934-1935. It is so strongly to be deplored that it is placed on the rare side of inferiority to which even on the upper river, even were way after planing made to work, even when it is not the case. The lower river still was put off food in the spring of 1934. It must be enough, dressed, and dried or an old in the winter of the season. July and August were the very men who may need it are straining every nerve to reach the upper river, where there is very little food. Once the nestlings, that is, on an overall of any large body of food, such as would be required by the increased population is impossible.

Enough has been said to show the impossibility of feeding the population in the winter of 1934-1935.

We may now turn our attention to the matter of supply. We are told that the Canadian government propose to give a monopoly of transportation over the old trail from Tilden, on the Stikine river to Lake Teslin. No reasonable person familiar with the conditions of the region will believe that a monopoly of a long can be maintained over a trail over a route in the mountains. No such person in his senses will allow that provisions could be taken from Lake Teslin to support for a population of thousands, in the winter season, over the frozen river. It is wholly impracticable. Therefore, therefore, the lack of a monopoly of by the route.

By the short route over the passes, I am tempted to suggest made, it is just possible that provisions might be raised there before the close of navigation. But that is what we are now trying to do is like reason to hope. While legs are struggling about a local prices, prices are high and waste, and many lives will pay the penalty. It is the wish of the country is checked and the influx of people is greatly restricted, and no escape from the conclusion that the winter of 1934-1935 will see starvation in the Yukon on an immense scale. Every instinct of humanity calls aloud for the provision of every possible transportation facility at once. Nothing but the old freedom in putting through every possible means of transport

natural desire to retain full and control of the means of transit, can be justified for a moment. The true interest of Canada, as

resources of the region, or I would accept a monopoly in rates of transportation as a compromise. Those who may be able to put their own resources to push through a year's supply of provisions for themselves will in the long run be as much benefited as any others in the welfare of the whole mass of immigrants for a starving man would respect no property rights of food, and to maintain the face of starving people may hope to keep his own store of life.

Coming out of such a time, upon a government like Yukon, is the writer's belief that it is imperatively necessary for the development of the goldfield that there should be a constant and uninterrupted service from the season to the Yukon, and although the interrupted navigation of the Lewis river—there again, to change from a non-going vessel to a river steamer on the Stikine, from that steamer to the railway, and then to another steamer—the Yukon makes the service at least as practicable. Another reshaping of the railway at Port and Harbour and from the cars to barges on the Yukon is so much easier and cheaper as to put an end to argument.

The present method of using wood as fuel at a great expense on the Yukon steamers can not last if the country is to be permanently developed. With coal loaded down the river in barges

we have come fuel and two or even more trips a season might be accomplished as a certainty. But should Canada have no influence now, here what I believe means of the indefinite or limited supply which a far greater profit would insure to the people of that country or land is possible through any short-sighted monopoly of transportation, which would infinitely retard the development of these Yukon gold fields in a very short time.

A broad and large measure of cooperation of both countries is essential. Let us hope that it may be realized before it is too late.

The length of the coast-line of Alaska is estimated at 14,211 miles which is greater than that of the entire coast-line of the United States.



# NOTES ON THE AVIFAUNA OF ALASKA

by E. W. Mearns,

*Biological Survey, U. S. Department of Agriculture*

Among the many interesting features to be seen by visitors to the State of Alaska, the otherwise desolate tundras are animated by swarms of water-fowl, which arrive from the south in spring as soon as the water grows deep enough to permit them to depart after a short delay on about their summer home-keeping. The water-fowl on the rivers and lakes of the interior are the familiar species which winter along the prairies and marshes of the western United States. The Canada, Pintail, and waterfowl, and on my lakes are there with swans and fresh-water ducks of many species. Besides these, and in lakes and numerous waters about the coast are the most strikingly colored species

The most interesting part of the fauna of this region, however, is found along the coast of Bering sea. Four species of eider are known at least, some of which are very numerous. Among the most interesting is the Black-throated Diver.\*

The Black-throated Diver is a rather fine bird peculiar to this country, it breeds here in the marshy region between the mouths of the Yukon and Kuskokwim rivers. It is the most easterly breed of its kind in America. The top and sides of the head and neck are snowy white, the chin, throat, and under side of the neck blackish, and the feathers of the back a sooty, gray color tipped with a black crescent, contrasting with the white. The under surface is similar, but paler and the feet are a yellowish orange.

The Black-throated Diver breeds along the coast of Bering sea in great numbers every spring and a bird of this sort is persons fortunate enough to secure good examples while the opportunity lasts.

During the four years the writer lived at St. Michael water-

\*I am indebted to Mr. E. W. Mearns, Executive Director of the National Museum, for the photographs of birds and animal groups in the Museum which illustrate this article.

## THE WILD FOWL AND GAME BIRDS OF ALASKA

frosty and a heavy snow had been falling with the consequence that it was necessary to buy in a supply of ducks and geese for winter. The question of cold storage was a serious one for the few or three hundred birds that were drawn out of the market in the winter. The climate did the rest, and the birds were not sold or given during the winter.



Among the numerous birds are many wild and the common ones.

and the young birds feed upon them. They are also very common and so delicately flavored that they are

We were able to see many, however, before the birds were shot and when the first solitary goose was seen flying over the water a record for the trip, there was general rejoicing. I did not remember the party yet with which we had been to the edge of the lake and attacked the place.

It was late and to the after dark flight, but it was then that we saw one of the

Two kinds of partridges are common on the mountain, and

and the



#### 4 THE WILD GOOSE AND GAME IN JUNE OF 1881

wings a few yards above the snow banks and then a loud, low, whistling, harsh, noise. Every now and then a flock of geese go and come back because for no reason for me they have wings sharp for a few days and then a few. The latter flies in the air and then it is over. They are in the air for a few days.

During the first week of June I was in the woods.

plumage. Directly one of the geese starts off in the air and then it is over. The latter flies in the air and then it is over. They are in the air for a few days.

in the woods and a few geese are in the air. The latter flies in the air and then it is over. They are in the air for a few days.

And from the birds which have a white and a black

and a few geese are in the air. The latter flies in the air and then it is over. They are in the air for a few days. The latter flies in the air and then it is over. They are in the air for a few days.

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among the mountains and valleys of the interior. Formerly large numbers were much more numerous in Alaska than at present, and the decrease has been almost entirely as the result of our ownership of the country. The history of the fur seal is well known. The sea otter is an interesting animal that is passing away. The seal is even more certain than that of the fur seal, for it is a dangerous thing for an animal to wear a coat worth from five hundred to a thousand dollars. All that has kept the sea otter from extinction is its shyness and the fact that the stony points of the coast frequently refuse to permit capture and capture. Upon the mainland are several fine herds of

There are several kinds of these deer—a large, dark-colored one called the woodland caribou, which lives in the wooded district of the upper Yukon, a light-colored or paler kind, called the barren ground caribou, which lives in the open tundra of the lower country. Barren ground caribou were once extremely numerous, and had once lived along the shores of Norton Sound and even several with their trails leading diagonally to the mountains, where the animals used to go in summer to feed. The present caribou is very scarce in the interior. But even so far back as 1877 the caribou was very rare along most of the coast of Bering sea. When Alaska passed under American control it became possible for the natives to secure better hunting places, and many were what is called "gamekeepers" called, and the result was a rapid slaughter of the large game.

Since the barren ground caribou usually live in the open tundra where there is no cover, it is extremely difficult for the hunter to approach unseen. Also too much of our western

men make a mistake and forget to watch even their interest before they become so interested by the common use of guns, the Eskimos have arranged the method of hunting in open ground which some of hunters and who was very successful. The

men upon land they would start directly for the mountains and

their horses together, so that from the front they appeared like one man. When they were still some distance away, the caribou would throw up their heads and start off to the side and then the hunters kept on in their original course, appar-



1. The first part of the paper is devoted to a discussion of the  
 2. various methods of determining the age of the animal.  
 3. The second part is a description of the animal's habits and  
 4. its range. The third part is a description of the animal's  
 5. anatomy and its various parts. The fourth part is a description of the animal's  
 6. life history. The fifth part is a description of the animal's  
 7. distribution. The sixth part is a description of the animal's  
 8. conservation. The seventh part is a description of the animal's  
 9. economic importance. The eighth part is a description of the animal's  
 10. cultural importance. The ninth part is a description of the animal's  
 11. scientific importance. The tenth part is a description of the animal's  
 12. historical importance. The eleventh part is a description of the animal's  
 13. future prospects. The twelfth part is a description of the animal's  
 14. current status. The thirteenth part is a description of the animal's  
 15. conservation status. The fourteenth part is a description of the animal's  
 16. management. The fifteenth part is a description of the animal's  
 17. research. The sixteenth part is a description of the animal's  
 18. education. The seventeenth part is a description of the animal's  
 19. public relations. The eighteenth part is a description of the animal's  
 20. future prospects.



Figure 1

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 future prospects.

In the hunting season, however, the Indians of Seward, hunting goats occur, but we have not the chance to hunt either on the range and on a large number of

not of the sheep. It is quite probable that in many cases they may have been taken from the range.

Goats also are very numerous in some places, and several kinds are known to occur. The large goat of Koonuk and the

I must look as if he belonged to the animal life of a former geological age, with the results of glacial age marked the earth. Black bears are generally distributed over the interior except on the barren lands bordering the Arctic coast. About the

country in the rocks where they make a bed of leaves and grass

the hunter wears a blanket about him and with it thrusts it out for the bear to push up

the thrust under the guard line formed. Both the

and cumber. The Eskimo hunters are very careful not to speak

in a disrespectful manner of bears and are especially guarded



against, but as any one knows their plan to poison a bear has failed. I believe firmly that if they should speak of such a plan again, so and such too. I know that one and would be a very serious attack. Their news figure lives in the folk-lore and cannot be one of the things of the people.

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At the Altamont, the peak concentration, the first flycatcher was half-grown in 1901, was killed near St. Michaels August, 1901. They are common in the parks of the Altamont north of Irving Street, as many were seen during the 1901. The record was in 1901.

represents a school known by the writer near Waukegan as not  
wholly out of the world. In summer these amounts are used &  
will not be a profit, but interesting in as far as possible. In  
winter when the girls present they are not dignified and I have  
seen of several children in my school and I have seen others  
who were and I have seen the same children.

In the late 19th century, as the park was being surveyed, it brought great herds of caribou and a number of bears. The Indians sometimes used the Lanesien islands but as a rule it was so many years many of the bears had to retreat beyond the strait every summer. As spring would be left stranded on St. Mathew and St. Lawrence islands. During the summer of 1864 Mr. Mott and J. J. Maynard found them on St. Mathew island to the north of a seven islands. When these gentlemen arrived

a few days before the fall season, but even so some sixteen or fifteen  
 bears were to sight on the boat approach. In shore, ten or  
 twelve were to be seen on the beach. Quite a number were killed  
 and preserved, but not all. They were fat and were a much more  
 easily approached. When aroused they stood and sniffed at  
 the party as if to learn whether they were friends or foes, and  
 when the men were seated the bears ran back to the shore.  
 In this run they were seen looking over grass and rocks with  
 their heads held high and grasping long.

And not the whale, the walrus is the largest blubber-eater. It formerly was very numerous around the coast and along the American coast of Bering sea. In the Arctic ocean, there is also a species of the *cetacea* we speak of, and a few of them are found near the coast here. The Eskimos report the females will raise to two very big calves in April and May, when we have young. At about the age of a year old, the male will attack a man and kill him, and he will use his tusks and long teeth to do so.



old bear. An Eskimo living at Cape Vane ever told me of a encounter he had had with a walrus while seal hunting in the vicinity off the cape, to which he had a companion and a narrow escape. They met and killed a young walrus without having seen the female. A moment later she arose in the water and catching sight of the hunters, uttered a loud wailing cry and dashed at them. The men paddled for their lives and reached a cove of ice just in time to escape. Here they were kept prisoners for nearly a day. Several times, as, just as they were about to attack them, at the moment they did so she appeared and drove them back on the ice. During our cruise in the Arctic we saw many families with young, and the watchfulness of the old ones was very noticeable. The young nearly always swam directly in front of its mother, and the latter, in diving, always carried the little one up with her by resting the points of her flukes on its shoulders and turning it over.

In the old days when caribou were abundant, wolves were numerous and ran in large packs. With the growing scarcity of caribou the wolves decreased, until, during our residence at St. Lawrence, they were scarce along the coast of Behring sea and the adjacent interior. The white and blue Arctic or stone foxes are common on the barrens, and the foxes are also common in much more widely distributed regions of the interior. The black fox is taken there every winter. The silver foxes, red foxes, and other American species and breeds are moving the

Alaska into recent developments.

Among the "cats and mice and such animals" are many species of marmots and shrews. The whistling marmots live in the mountains above the upper Yukon and Tanana rivers, and the pocket gopher and shrews are also found in that region. The last named animal makes its home in broken masses of rock and has

reared like that of a toy dog.

The great increase in the population of Alaska which is now taking place cannot but have a decided effect upon the large game. Most of the prospecting parties will be composed of

men and boys. With a population of thousands of

be dangerous to see him make better mounted sheep, caribou and moose. Unfortunately not a museum in the world has even a possible representation even Alaska of any of these animals.

Not threatened or by extermination of such fine species is to be greatly improved, but cannot now be supplied as it is altogether probable that we have two or three years to wait for extermination if not impossible, to use the specimens for scientific purposes. The U. S. National Museum in Washington is the proper repository for a full representation of the animals indigenous to our territory, if unfortunately any species were exterminated, and it will be a great loss to science if any of the large Alaskan mammals become extinct, or a proper series of skins and skulls is in the possession of this institution. I wish to impress this upon settlers and others going to Alaska in present season, to the Department, having their attention called to the matter.

Very truly yours,  
 J. W. Gresham, U. S. Army.

## CLIMATIC CONDITIONS OF ALASKA

By General A. W. GRESHAM, U. S. Army.

The most obvious elements of climate are those of temperature, humidity, precipitation (rain, snow, fog, etc.) and wind. And of these temperature and precipitation affect most probably the comfort and prosperity of man.

It is now less than 5 years since the writer was one of several commissioners of the late General A. J. Myer as to the establishment of stations of observation in Alaska in 1871-72; he was accompanied by the late General W. B. Hazen regarding the extension of the system of land observations in the same territory and adjacent known regions. A certain class of persons always was present on expeditions being sent to the interior, namely, men, women and children, and a few men, no less than 10 or 12, for the purpose of constructing and for a record of recording meteorological observations by volunteer observers on the water edge of this civilized world. "What knows or cares, and then," whether the Yukon river flows into Bering sea or the Arctic ocean, and of what use is a knowledge as to the summer and winter conditions under which the animals of the river vary in number and life?"

Why the question answers are I, and tens of thousands of

gold regions of the upper Yukon. It therefore seems likely to

different parts of Alaska as may give at least a general idea as to the weather to be encountered.

Most extensive conditions have two kinds of climate: first, the continental type, where far from the sea we find hot summers, and winters, but it is rainfall, and much snow; second, the local or shore type where the heat of summer is, the cold of winter are modified by a steady breeze from the ocean bringing on, once or twice a day. To these Alaska adds a third kind, the mountain or inland type, where the winters are, comparatively speaking unduly warm and the summers relatively cool, wind, rain, fog, and clouds are prevalent through the greater part of the year.

Considering first the marine climate, it is to be said that it prevails on all the coasting lands of Alaska in the Alaskan archipelago and in parts of the Alaskan peninsula. Naturally the extremes of temperature become more charged to the north.

The local or coast climate of Alaska is materially tempered

keeps at an unusually high temperature too there are in fact winds that, blowing landward, come at large quantities of rain or snow, depositing large quantities of actual heat to warm the land. These enormous quantities of such heat and its influence on

excursions, which at one time "one gallon of fuel gives out but at least will run to more than seventy-five pounds of iron and 45 pounds of cast iron.

The settlers and miners of Alaska will find that the coast, and along shore especially as one goes inland the climate is a mixture of the two prominent types. Cold, of course, and rainy summers, and raw, damp, foggy and not very cold winters are to be expected along the immediate coast, consist of two parts.

Winters are subject to heavy precipitation, and results in deep snows and low temperatures for a considerable part of the year.

Winters are subject to heavy precipitation, and results in deep snows and low temperatures for a considerable part of the year.

and the winters marked with excessive cold, though the winds are usually light. The weather, usually bad in zero, but rises for months, and even in July, with the daily temperatures of  $70^{\circ}$  to  $80^{\circ}$ , it is no uncommon error for the temperature to fall during the night to the zero point and of a freezing point.

Let us now turn from general statements to specific data from such selected stations as are acknowledged as climatically typical of various parts of Alaska. In so doing one turns naturally to the valuable article and tables in the meteorology of Alaska published in the *Progr. Coast Pilot*, 1879. Although a work and charts are 21 years old yet they are the only dissemination of data that have ever been published on the general meteorology of Alaska.

At Barrow, the coldest winter on record; the lowest recorded temperature is  $-12^{\circ}$  and its maximum  $62^{\circ}$ . The temperature rarely exceeds  $30^{\circ}$ , and in 1875 it only reached  $45^{\circ}$ . The coldest is the coldest month, with an average temperature of  $20.1^{\circ}$ , and August the warmest, with a mean of  $48.4^{\circ}$ .

Wetha is a typical inland station for extreme southern Alaska and Cape Barrow of the northern. In 41 years Wetha had extreme temperatures of  $88^{\circ}$  and  $-4^{\circ}$ . The coldest month is January, at  $4^{\circ}$ , and the warmest August,  $54.9^{\circ}$ . Every year there is a heavy snow fall, on an average 1.5 to 1.56 inches, and it has fallen no less than 280 days, but in 1881 there were only 114 snow days. The annual rainfall is very great, being 34.40 inches of which about one-half falls from September to December.

At Cape Barrow, the extreme northern point of Alaska is at  $71^{\circ} 23' N$ ,  $156^{\circ} 44' W$ , and its climate is important as indicating closely that of the coast-line of the whole interior or inland region situated along the Arctic ocean. It should be remembered that as one goes north the winter becomes colder and longer, the summers warmer and drier. The observations of Capt. P. H. Lay, 1881-83 and of H. M. S. *Proser*, 1852-54, are the basis of the following notes: The winter is long, as freezing most not abating from early September to early June, when summer comes in full force. The mean winter temperatures are November,  $-15.4^{\circ}$ ; January,  $-17.5^{\circ}$ , and February,  $-18.6^{\circ}$ , with occasional periods when the cold is from 40 to 52 degrees below zero. The average heat of July is  $58.1^{\circ}$ , and of August  $57.9^{\circ}$ , and the temperature often rises above  $50^{\circ}$  and has four red

85.5°. The snowfall averaged 1.4 mm at night, but 1.5 mm in the day, the greater part falling from July to October. The severity of the cold is indicated by the fact that the ground was frozen 150

and gales are most frequent from August to November and the heaviest winds are from February to May. The heaviest snow falls are for tests about May 1. The trip is at a low fare.

The watershed of the Yukon includes the regions whose climatic factors are of the greatest interest to a proper understanding of the river. Fortunately, there are a sufficient number of trustworthy observations and at least closely approximated the truth.

St Michael 68° 28' N, 162° 44' W, after which an island named "Key Island" is a mainland near the mouth of the Yukon. Its climate characteristics have been fully set forth by Mr B. W. Nelson. The winter is very long the average temperature being below a freezing point from October to April inclusive. The coldest month, February, averages from two to three degrees below zero, but in 1877 it was -24.7°. A thermometer as low as -37° has been observed. The warmest month, July, has a mean temperature of 54.9°. It would be said that the summer months of any year closely resembles the same months of any other year, but there are great variations between the same winter months of various years. Spring begins in the middle of May, but it reverts more or less to winter through a part of the month. Summer is very depressing. A number of frequent squalls of misty rain and the prolonged presence of many days of an overcast, owe clouds. Winters are marked by long periods of not only clear days, which are usually of intense cold. Strong gales occur irregularly through the year. Winter is most frequent in autumn yet fiercer winter storms are not uncommon. It will be remembered from previous chapters of blinding clouds of snow and temperatures consistently below zero, sometimes dropping, as even the barometer sometimes partially frozen. The harbor closes as a rule by October 15, and remains closed till June 15. The temperature of the Yukon reaches at the 1st of June is usually below zero several dry days. Very heavy snows are frequent at this season. The present season especially since 1890 has been a dry, of which the greater part falls from July to September. Snow has often in summer, sometimes in notable amounts. Rain or snow falls three days out of five from August to October, but only one out of four from January to March.

of warm, hazy days, free from high winds or much rain. The Yukon closes about October 20 and opens late in May. At Igrookut mission,  $61^{\circ} 47' \text{ N.}$ ,  $161^{\circ} \text{ W.}$ , the river closes about No-

vember 14th, June 5

Mr A. J. Harry gives in the *Monthly Weather Review*, August, 1887, other representative means for short periods. The lowest monthly means are as follows: Anvik,  $62^{\circ} 37' \text{ N.}$ ,  $149^{\circ} \text{ W.}$ , December  $-31^{\circ}$ ; Tiklukyet,  $65^{\circ} 10' \text{ N.}$ ,  $152^{\circ} 45' \text{ W.}$ , January

$-11^{\circ}$ , Igrookut (a short distance up the Yukon) from Chitina City,  $63^{\circ} 30' \text{ N.}$ ,  $142^{\circ} 38' \text{ W.}$ , January,  $-16.8^{\circ}$ ; Camp Chitina, about  $64^{\circ} 45' \text{ N.}$ ,  $141^{\circ} \text{ W.}$ , February  $-12.3^{\circ}$ ; Camp Duvallon, about  $67^{\circ} 30' \text{ N.}$ ,  $141^{\circ} \text{ W.}$ , January  $-17.4^{\circ}$ ; Fort Reliance,  $61^{\circ} 10' \text{ N.}$ ,  $136^{\circ} 25' \text{ W.}$ , January,  $-28.7^{\circ}$ .

aboutly are guarantees of the rest of the world. While they do not give all the mean temperatures, yet they record the climate in a non-biased manner of value. In July only the temperature of

the temperature rose on 25 days, on 10<sup>th</sup> and 11<sup>th</sup> above  $50^{\circ}$ . The extreme severity of the winter is indicated by the fact that from December 1, 1899, to February 1, 1900, the temperature fell below zero every day. On 25 days it fell lower than  $-40^{\circ}$ , on 14 days lower than  $-50^{\circ}$  and on nine days lower than  $-60^{\circ}$ . The mean temperature for January, 1899, was  $-4.1^{\circ}$ , and for February,  $-5.04^{\circ}$ . Bright weather is the rule. From October 1, 1899, to the 1st of May following, snow fell on only one day in seven. In June, 1899, however, it rained on 12 days and the temperature rose above  $50^{\circ}$ . The Yukon broke up on May

ice on October 20; it was frozen solid November 5

Jawson, in 1880-'81, communicated to THE NATIONAL GEOGRAPHIC MAGAZINE of November, 1887, by Mr E. W. Nelson, con-

conduct, January, and February were  $-31^{\circ}$ ,  $-7^{\circ}$ , and  $-2^{\circ}$  re-

$-41^{\circ}$  and  $-66^{\circ}$ . Snow fell but one day in February and 25 days were perfect y clear.

While the cold days of May were not exceptional, the Yukon rivers and the snow valleys as a rule caught and held water, the development was not so rapid as in the spring of September but was rapid from a late start.

By methods familiar to geographers the comparative means for the supposed best month—December, January, and February—have been calculated for all the points hereafter mentioned except  
 Yukon,  $61^{\circ}$ ,  $130^{\circ}$ ; Aukuk,  $66^{\circ}$ ,  $127^{\circ}$ ;  $N. 130^{\circ}$   $W. 135^{\circ}$ ; Circle Bay,  $-112^{\circ}$  and Dawson,  $61^{\circ}$   $60'$   $N. 135^{\circ}$   $W. 121^{\circ}$ . Any season will probably be considerably warmer or colder than is here calculated, but the means are practically correct and afford a good idea of a wintering point. The value of the Yukon, and therefore have a definite value but a wild and seek to wrest from rugged and inhospitable Nature the golden horde of Alaska.

## A YUKON PIONEER, MIKE LEBARGE.

The first who ever explored the Yukon between the Russian settlements and the Hudson Bay post and Port Yukon were Frank Ketchikan of St. John's, New Brunswick, and Alfred Le Page, of Chateaufort, Quebec. After the death of the American Kent, it was at Nulato in May, 1886, the expedition which he had planned and which was only waiting for the ice to pass out of the river to make a start, was loyally and successfully carried out by his chosen and faithful companion. This expedition the river from Nulato to Port Yukon and then returned across the portage to St. Michael and reported to the general manager of the Telegraph expedition of Colonel S. O. McKenney at that post. The following year the party was augmented by William H. Lebarge and Frederick Whyper, who wintered at Nulato. Ketchikan and Lebarge then took a remarkable journey over the river to Port Yukon in March, accompanied by two Indians. They arrived safely at their destination just as the ice was breaking up, and after the first of winter was over took a bar to Port Yukon and continued their explorations to the junction of the Lower and the Upper Pelegah at the mouth of Port Se Kirk. Returning, they wintered at Nulato and then returned to Port Yukon.

of the party having made the journey to that point in car.

St. Michael, and finally this morning the first cutter was brought from  
the headwaters to the

mouth of the river. The cutter was a small  
craft, and in May 1891 the cutter was  
captured by the American navy. On  
the vessel were killed eight and his companions on their way



of the expedition of the Western Union Telegraph Company  
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the former American Fur Co., and in 1871 entered the service of the Alaska Commercial Company, from which he retired, with a modest competency in 1875. He is now living in an active town in the Province of Quebec. Although he travels, a delightful companion on shore or by the camp fire, full of experience and ever helpful, tactful and pleasant in his dealing with the natives, his position and help led to the inexperience—in short a

His services to geography are commemorated by Lake Laberge, on the direct route to the Klondike and Laberge river an offshoot of the Yukon from the north-west of the Yukon. The name Laberge has been variously spelled, the former also among the natives, but has been adopted as here written by the U. S. Board on Geographical Names. Frank Kotelnikoff, under the green turf of our Klondike. Hence May his faithful companions and our good friend survive for many happy years.

WM. H. LALL

## ALASKA AND ITS MINERAL RESOURCES\*

By SAMUEL FRANKLIN EMMONS

*U. S. Geological Survey*

WASHINGTON

Alaska was first visited by a Russian expedition under Bering in 1741. In 1799 the territory was granted to a Russo-American fur company by the Emperor Paul VIII, and in 1802 the charter was renewed for twenty-four years. In 1807 it was ceded to the United States for a money payment of \$7,200,000. The first mining excitement in the interior was in the Cassiar region, a district in British Columbia around Lake, near the head of the Stikine river from 1871 to 1887. Later, prospectors found their way into the more northern region and down the valley of the Yukon into American territory, where they discovered

rich, small quantities of minerals of the Yukon. In the autumn

\* This paper, appearing with the permission of the directors of the U. S. Geological Survey, is an abstract of a pamphlet prepared by the author to accompany a map of Alaska, and containing much information, culled from data in the possession of the service, as it was thought would prove useful to the student or prospector who sought this knowledge.



Becker and W. H. Daly, at the orders of the Director of the United States Geological Survey, made examinations of the

resources of the gold-bearing rocks of the Yukon district. It is from the reports of these later explorers that the data collected in the following pages have been compiled.

Alaska contains an area of 586,107 square miles, of which a quadrangle of 1,000 miles, with a parallelogram extension at the southeast along the coast and a peninsula extending out into the ocean on the southwest which continues in the chain of the Aleutian Islands, but separates the region from the Pacific Ocean. The eastern boundary is defined by the 141st meridian of longitude.

Alaska, Cape Prince of Wales, is on the 68th meridian, or within 54 miles of the easternmost point of Asia. In length it extends from 54° 4', the southern point of Prince of Wales Island, to Point Barrow, to 71° 25' north latitude, far within the Arctic circle. Its greatest extent in a north-south line is thus 1,100 miles, and from east to west 800 miles.

The coast line is much broken by arms of the sea, reaching far inland, either as open bays, as gulches or as merged river val-

leys, an aggregate area of 61,200 square miles and which as a rule are very unproductive. The chain of the Aleutian Islands, reaching nearly 1,500 miles into the Pacific Ocean, is largely composed of craters and contains many volcanic craters, some of which are yet active. They are very markedly in the main, elevated to an elevation of several thousand feet, and on the whole extend to a height of 20,000 feet.

The Aleutian archipelago may be considered as constituting the best and most fertile and best part of the territory, because it is a interrupted portion of a narrow belt of fertile lands in the same system. The total population of 1,100,000, the largest and most fertile part which is known of Alaska is in the Iktrook region, a very narrow and very narrow waterway, a narrow furrow and not very elevated of previous occupation by glacial ice. In some cases, as at Chukotka, the old glacial ridges are low, but their heads. The islands themselves are surrounded, and the average elevation of 2,500 feet. On the seaward

side of Barrow is 401, one of the outer for 40, which makes a total of 440 volcanic craters called Mount Edgemoor, 2,545 feet high. Further to the westward, forming part of the same mountain range, the St. Elias range which divides the northern coast, contains many high mountain peaks, the highest to the north of Alaska being at an elevation of 18,124 feet. Mount Logan, the highest island, is supposed to contain a glacier, and explorers report that far in the interior between Chukchee river and the Lower Yukon, there are a great many mountains, exceeding in the same general direction, of equal or perhaps even greater elevation the highest point of which has been designated Mount McKinley. A second line of elevations is supposed to exist of some westward from near the head of the Copper river, following the coast and in the interior of the Alaska peninsula.

There are rivers in the interior the waters of the Alexander archipelago are generally short, and only two, the Stikine and the Taku are known to have crossed the crest of the mountain range immediately adjoining the coast. The Chukchee river is a considerable

river west of this probably less than 100 miles in length. The next river northward is the Alsek, doubtless probably unknown, but it is supposed to arise on the east side of the St. Elias range, in the vicinity of Mount Logan.

Copper river is a larger stream than any of those thus far mentioned, and flows through a mountainous country, containing several high peaks with an estimated elevation of 12,000 to 18,000 feet, and also known to export by the Indians, several masses of native copper, of which the specimens were made, were obtained and sent to the Smithsonian Institution. A smaller branch of this stream, is said to head between the Sushitna and the Tanana rivers, and empty in the lake which on the map is represented as being drained by the Sushitna. The Sushitna also is a reported stream, emptying into the head of Cook's lake, very wide and difficult of passage, and empties into the bay owing to the great rise and fall of the lake. Its sources are in a high mountainous region, a mountain ridge, and a branch being supposed to head near Mount McKinley.

The next large river, the Kuskokwim, is the second largest in the Territory, its length being estimated at over 100 miles. It drains a mountainous region rather full of snow. The Kuskokwim ascended in boats as far as the Roman, K. K. make of or crossed from the Yukon by a portage near Idagagait. The currents

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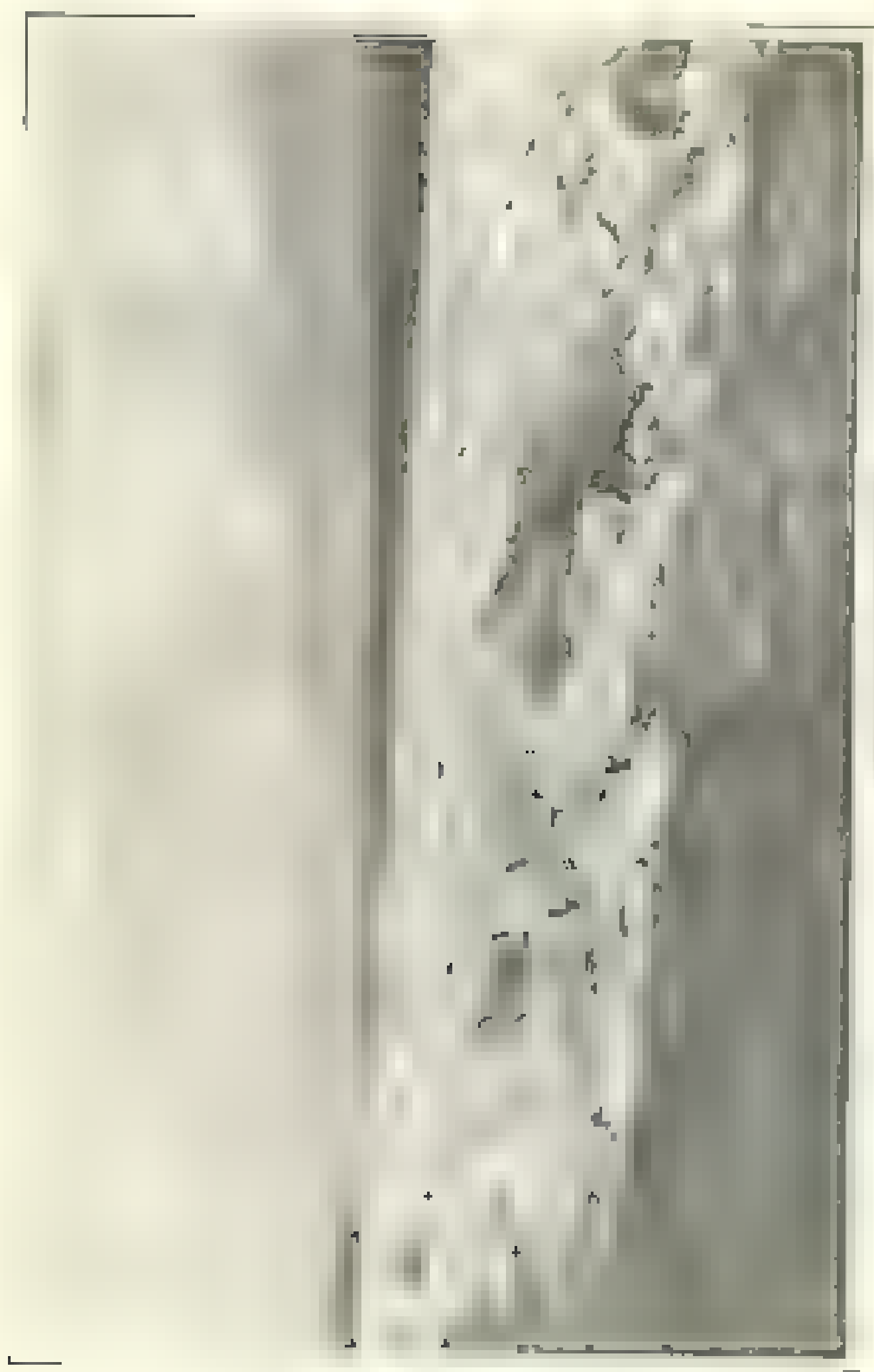
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run by lakes on the eastern side of the Coast Range.

1. The first part of the paper is devoted to a review of the literature on the topic. It starts with a general overview of the field, followed by a more detailed discussion of the specific issues at hand. The author then presents his own findings, which are based on a series of experiments. These findings are then compared with the results of previous studies, and the author discusses the implications of his work. Finally, the paper concludes with a summary of the main points and some suggestions for future research.



to get the river to flow.

The Yukon is generally a broad and meandering stream, flowing with a current of 4 to 6 miles an hour. The stream is at times in a narrow, rocky canyon cut through lava, or across low mountain ridges, and such stretches are locally called "rapids." For the most part, however, its valley is wide, and the stream

between the banks covering a width said to reach 10 or 12 miles.

At Fairbanks. Although the river is frozen up during eight months of the year, from October to June, its importance as a means of transporting supplies can hardly be overestimated. In

Port Slick down to the mouth of the Porcupine and up that stream to the Mackenzie, preferring to make the long and cir-

direct route across the snow lands to the eastward.

The international boundary between American and Canadian

considered as part of the general province of Alaska. It is known as the Yukon region, which is the only state of the Arctic region. It is the only state of the Arctic region. The stream is at its various points of confluence the most western portion of the continental system, located between the coast and the Mackenzie river system, which are about 70 miles apart and approximately parallel. The Mackenzie river flows from the north where it is the Arctic ocean. To the south of the river for centuries of the past there were northwestern of the Arctic region of the Arctic region, it would seem that the region is the region between the Yukon and the Mackenzie represents the Arctic region. The Arctic region is the Arctic region.

states, since south of the 49th parallel the bulk of the Sierra Nevada is composed of igneous rocks.

The highest range proper is a broad elevation, but with many scattered peaks, but not differentiated into distinct ridges.

To the east is a plateau-like region which descends gradually to the north, from an elevation of 5,000 feet to the alluvial region to 3,000 feet in the lower Lewis and Clark river valleys. The river valleys in this stretch often are 2,000 to 2,500 feet below the general plateau level.

In the winter or part of the year is frozen for a large portion of the year, so that there is comparatively little rock decay. Where there is no low ice the surface is generally covered with an abundant growth of moss. Thus, wherever the surface material is sufficiently compact to become a reservoir to water by freezing, produces large areas of swampy flats, even on steep ground. With, except in the glaciated region or where it is covered by large streams, obscures the rock surface and renders difficult the work of the prospector.

The northwestern continental, ice-sheet, or continental glacier of Dawson which extended in British Columbia between latitudes  $55^{\circ}$  and  $56^{\circ}$  N., did not extend in this interior region north of the 49th parallel. Hence the greater part of the Yukon basin is not last glaciated except by local glaciers. This fact has been readily recognized by the geologists who have visited the region in recent times, and is evident from the section of the basin by their numerous glacial moraines and their absence below it.

*The Yukon river water route*.—This route is by ocean steamer from Seattle or San Francisco to St. Michael, near the mouth of the Yukon, the sea by rivers into and up the Yukon to Dawson. The length of this route is about 4,400 miles, it takes nearly 2700 hours from Seattle to St. Michael, and about 1,000 up the Yukon to Dawson. The so-called water route is to have St. Michael early in July, and to proceed to Dawson at a rapid rate. Progress is made by small boats at low stages of water later in the season. The time from Seattle to St. Michael is about twenty days, and that from St. Michael to Dawson the same, making about forty days for the trip. Under favorable weather and circumstances it may be made in less time. Though this route is the one over which commercial companies operating in the Yukon country



enter in the spring, and at that season it takes several weeks

unpleasant for persons obliged to rough it on the trail.

*The Skagway or White Pass route*.—From Seattle to Skagway a distance of 1115 miles, the route is by ocean steamer or port-wagon along the coast, and finally by Lynn Canal. It is practically an

almost continuous barrier of densely wooded mountains. The

on the east side of Dyea inlet, a branch of Lynn Canal. Its population

project across the trail is said to be about 8,000. Dyea is situated four miles north of Skagway west of the mouth of Dyea river and on the head of Dyea inlet. The road and land of the same

character with the whole of the section, to which freight is taken

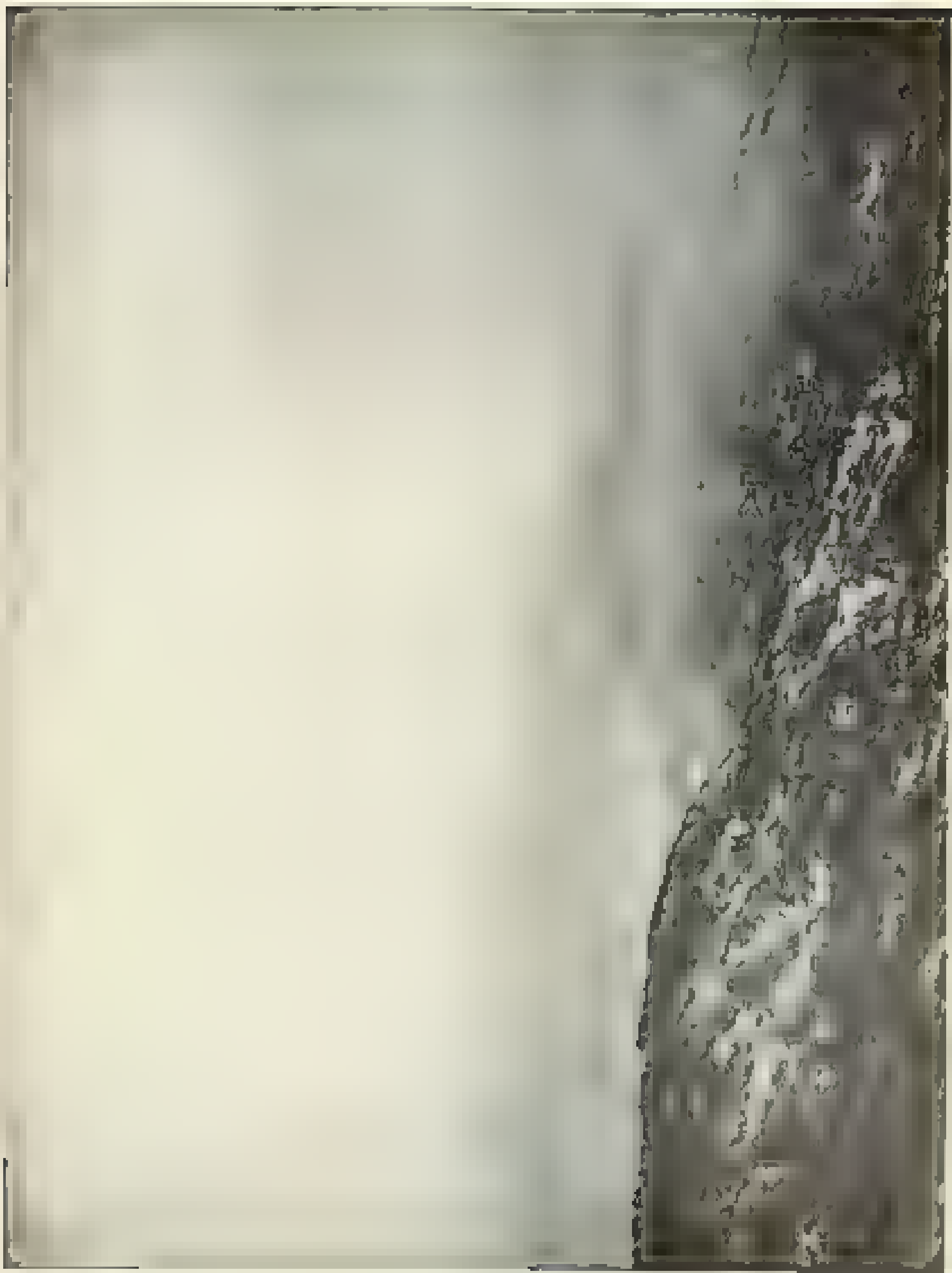
several new wharves are said to be now in preparation.

mouth, where waters flow into the Yukon. The main road of White

road, which crosses the river several times by ferry. A high

summit is a steeply, hard climb, but, as the road is not

which is the ordinary camping place. The trail passes the two main lakes known as Summit and Middle lakes, on whose shores



ridge may be seen, when the water is not frozen. At any season of the winter and lake is a bet as you can if you have been to a lake near the town in a customhouse office is a large pile up a large bag each, which is used as a pile of skins and bones covering the ice. At this north end there is a trail to the north town to Tongue Lake, and as there are seven miles of the distance you between Tongue and Eagle lakes, it is a hundred for the Indians are warned for taking the route. At the head of Lake Huron the Sagaway port is the old trail. The Sagaway is a small trail for a trail that over the old trail pass, but the pass is much lower. It might be a more or less of a road to be cut in a small way up place. This route is now used by me in the old village of the State of Michigan in the north end of the lake.

*The Times* and *The Daily Express* in 1949, together with the I. Ching and co-ordinating, he had a year and a half project, by the time he was owned by an agent and, consequently, when I started the project. It is time for me to go to the beginning of the project.

Dyon or Talye is a small lake with a narrow gagee or road, leading to the extensive shore at the head of Dyon, and the wind-  
dried and sun-dried grass and other drying cargoes from various rivers  
are here layed out on the sand beach. They are not carried on  
by men as if it is a small lake. A rocky point abuts on it  
from the head, whence there are a few small waterfalls. Dyon  
trail is a wide shallow one to Dyon river. A large forest of  
~~some~~ ~~some~~ at its close from 10 to 15 feet, to the head of Lake  
a total distance of 24 miles. The stream is 10  
miles from Dyon, to the last 4 miles full with a comparatively  
open valley, in which there is a good stage road. On the  
left wing of the stream within 20 miles of the valley the  
river is not navigable. On the lower side for 10 miles, the  
river is navigable on the river is deep. The third river is a

On way we went with a stage - pack train, which at all stations  
rested, at times for a 4 miles further on. The route the only one  
to the interior has since have been successfully used for  
several years in packing to Sheep camp. The camping places  
are found all along the route from Dyea to Sheep camp, and at  
several points refreshments may be obtained. Sheep camp is  
the last camping place on the west side of the range, as from  
there on there is no other (for fire) until Deep Lake, no other  
open, 12 miles distant, is reached. From Sheep camp to Snake,  
where packs are weighed by the Government and stored, a stage on

of 34 miles, the rise is about 1,800 feet. The trail is free from mud, and traveling is not difficult although the mountain ground is covered with boulders. From Seneca to the summit of the pass the ground rises 1,600 feet in a distance of about 14 miles.

and is open to the pack animals. The building of a road or

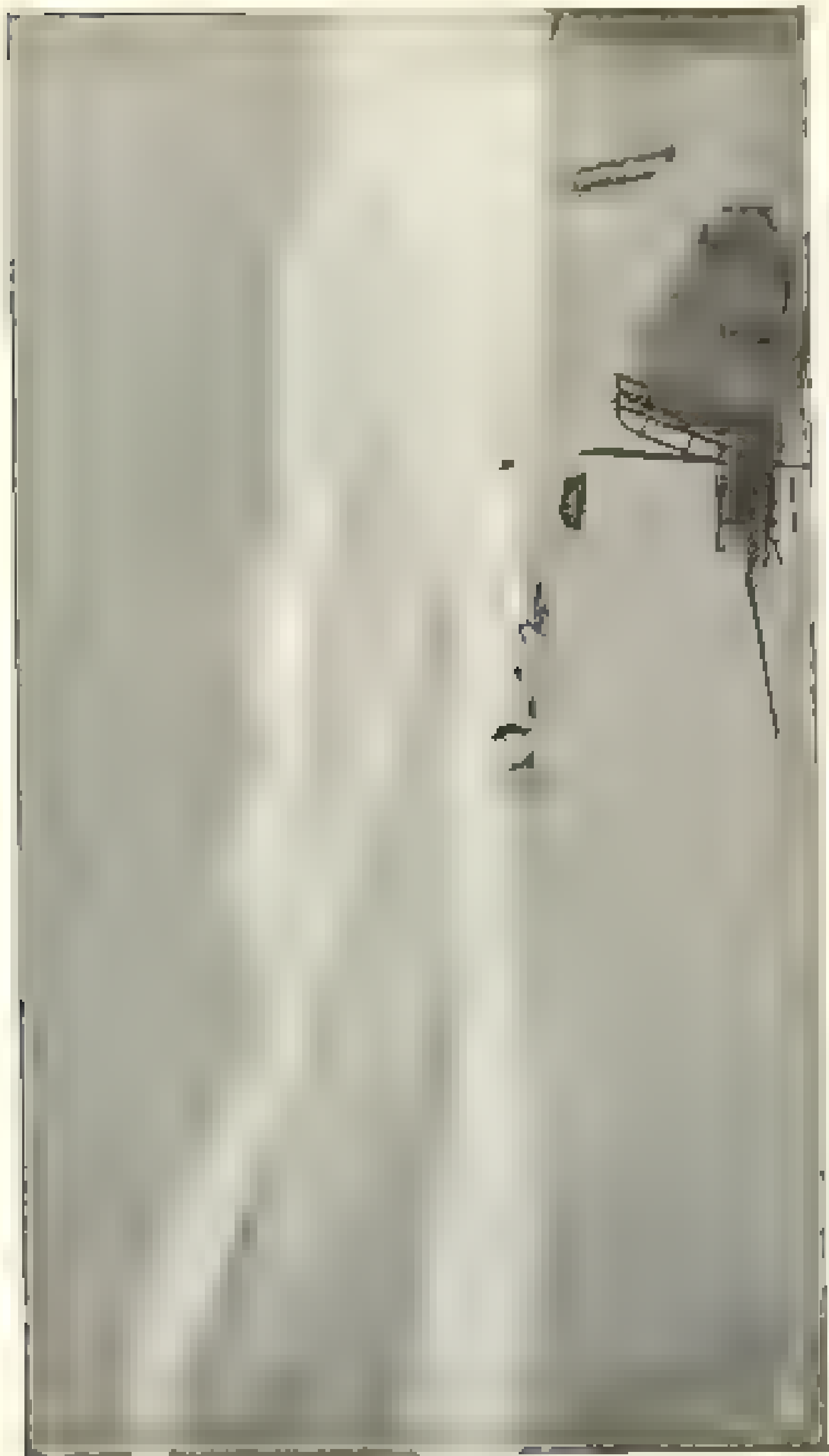
been contemplated for this portion of the route. From the head of Lake Bennett to Lake Linderman, a distance of 15 miles

lake, and thence more gradually along the drainage way of a chain of lakes known as Long, Canyon, and Deer lakes which are connected with one another and finally with Lake Linderman by small streams. Till late in spring and while this drainage way is frozen over, and one travels from the summit to Lake

south of which sometimes reaches a depth of 50 or 60 feet forming a sort of nose of limited extent. Late in the season

a distance of 50 miles. From the foot of Lake Linderman there is perhaps perhaps rapids to the head of Lake Bennett, where the pack and stage-way trails meet.

From the head of Lake Bennett to Dawson, 548 miles, there is a continuous waterway through lakes and rivers, which may be traveled in summer by boat and in winter on the ice. Long distances are not gone by navigating at seasons. Boats may be procured or built at the head of the lake, but it would require the most experienced is not and is to start early enough to travel on the ice as far as the foot of Lake Linderman, where the trail for northward going is abundant, as in this way the danger's passage of the White Horse rapids is avoided. Lake Bennett is 20 miles in length, narrow and canyon like in form, and lies at the lower end. Fifty miles above the head, where the south-west arm comes in strong winds. Ten or twelve miles long a river runs that is dangerous for boats, as it passes are often stormy and there for several days. A sluggish stream, 2½ miles long and often not more than a few feet deep, known as the river crosses the outlet from the foot of Lake Bennett to Tagish lake. Thence there is a clear sailing 10 miles down Tagish lake and five miles a long a river deep enough for ordinary river steamers to Marsh or Mud lake. Marsh lake is 10 miles long and empties into Flyn lake river whose current averages three to four miles an



17-25

about 25 miles from the river enters Miles Canyon, a channel about 100 feet wide and five miles of winding length between steep, colorful walls of basalt 50 to 100 feet high. The swift, turbulent current carries a boat through this canyon in about three minutes. For a large-sized boat, not too heavily loaded, which is kept under way by one or two good men and a following of the crew, so as not to be dashed against the steep rocks on either side the passage is the practice. At the foot of the canyon one must keep a lookout for the heavy swells and turn out early. The right-hand bank is the easier run, at least. A boat crew, which is followed by many, is to portage one's load on a good path side of the canyon, over which, about 200 feet high, and run the boat through safely.

It revealed the side of a mile below the canyon are rapids about half a mile long, which, though very rough, are not dangerous. Although below these are two White Horse rapids, the most dangerous in the whole river. They are about one mile of a mile long and are controlled between two small islands. Near each of the islands is a rapid, forming a chasm, only 30 yards wide, where the head of the stream creeps suddenly, so that the river rushes with a great force, leaping and foaming in a cascade. Although boats have passed successfully through, but there have been swamped, with loss of outfit and sometimes of life. The river runs in a narrow area of the rapids and below the rapids down by the river. The portage is on the west shore, but on either side a narrow way could be constructed with great facility.

Lower the river, which is about 100 miles from the White Horse rapids, is all rapids, large and many, dangerous to navigation. There is a small island at the foot of the river below the rapids, as far as portage is concerned, and is also a navigable for 100 miles. Below the Five Falls rapids. Here a rock of conglomerate rises up from the river bottom, forming several islands and backing up the river a foot or two, so as to produce a strong swell below. Scattered by of the same rock on either bank render a portage at this point is, no doubt. With proper arrangements, however, a sailing boat may run through safely. The right-hand side is covered by mud. A good travelers, that is, one of the Canadian survey team, a local expert, to provide the boat, following the west bank as also possible. For a few miles below the Five Falls rapids the current is swift, and then occur the high rapids,

which enters halfway across the river from the western bank producing a decided ripple. On the east side however the water is comparatively smooth and calm. Below this the river is pretty much free from rapids and navigation is unimpeded. Fort Selkirk, where the Peace and Lawrence unite to form the Yukon, is but a few miles. Thence it is about 95 miles to the mouth of the river. It is about 100 miles to the mouth of the Stewart, 100 miles to sixty-five river, and 45 miles further to Dawson at the mouth of the Klondike.

*High level Indian trail route.* This is a well-travelled route following a direct course in or near the upper end of waterways from the mouth of the Klondike to Fort Selkirk. It has been used by J. Dalton & Co., for some time as a pack-trail route for driving caribou, but it is definitely known of its geography. It is said to first follow the Klondike and Klondike rivers, crossing the divide at an elevation of 7000 feet and thence descending into the drainage of the Thelon river at Lake Arke. From Lake Arke, the trail is said to pass over an unbroken plateau, well timbered in the valleys and well grassed on the slopes. The distances from the head of the river are given as 15 miles to the watershed and 100 miles to the Indian trading post, from there to the ferry the distance is 200 miles, or 300 miles if all to the ferry and 400 to 450 to Fort Selkirk.

*The Stikine route.* By this route we travel by boat from Fort Wrangell 150 miles up the Stikine river to Telegraph Creek and thence about 10 miles west of north 100 miles to the head of Teslin Lake. The descent of the Stikine river is to some extent a dangerous one, the current is strong and rapid and often, it is, however, the route that was followed in former days by men going to the Cassiar District. From Telegraph Creek to Teslin Lake the trail is said to pass through a well timbered and well-wooded country which presents no obstacles to the running of a pack-trail. Lake Teslin is said to be about 30 miles long and broad on both sides by half a mile. From its head it runs to the lower part of the Teslin river where it is said except for two small rapids, one near its head, the other further down. In its lower course the Teslin spreads out into many channels, forming a broad width of two or more miles. This route appears promising, but is as yet only a prospect.

*The Taku route.* This route goes to the Taku inlet and river and crosses directly to Lake Teslin or Aklavin, a distance of 150 miles from Dawson. Thence it is but a few miles to the Stikine route.

By this route one travels by descent from Jomun 3 miles by the Takka river to the foot of a large glacier, which is often very dangerous to pass, even at a distance of several miles, by reason of the ice masses that break off from it, often by boat on, as is the Takka river to the head of canoe navigation. The portage will be some 20 miles from the canyon-like valley of an enormous lake, then for 30 miles in level valleys of the upper Takka, and is supposed to be a good road. For the last 15 miles the route is in the dense, wooded valleys of Feshu lake, a more than usual road. This route is said to be too long, unsuitable for a railroad, and a shorter for one one has only been planned by the Canadian government. The latter is, however, having not yet been thoroughly tested. Both lines are the sickle route into the continent a advantage of avoiding the dangerous White Horse rapids.

*The Copper River route.* This is the only line, route within American territory, which is made in any form near the mouth of the Copper river and a short general northwesterly course for several hundred miles, thus crossing a great amount of mountainous and rugged topography and many glaciers that cross the range and across the general travel of the line. Over the country settled at the coast nearly, with a road or less beyond the mouth of Copper river and 70 miles from Eska, and in 1875 a population of 22,000, but in 1880 the population was 20,000. According to the report made by Lieutenant Allen, who passed to the Yukon in 1880, the better way is to start inland at a point about 10 miles from the White Horse rapids, crossing the Yukon glacier about 10 miles above its mouth, thus avoiding the gorge and the most dangerous rapids. From the Copper river basin the route would be over the Selkirk and the lower White river, but avoid several mountains by leaving at a point that is a point which is an elevation of over 5,000 feet is not known by a general about 40 feet above the White river abundance in population for a distance of 100 miles. Russell who visited the Mount St Helens region in 1880 and 1881, reports that the most region to the northward is crossed by large glaciers. This region is to be expected along the coasting route for by parties sent out by the War Department.

#### FOURTH CHAPTER

##### *Geographical Features*

At present the fur as known is on the coast of the Yukon at Deep River and the other side of the good bearing road. Here it



Lead mining is a well established industry, and a fairly large quantity of ore has already been or are extracted from these veins. The principal occurrences of lead in Alaska are found in a belt some 100 miles in width on the seaward slope of the Fairbanks range, as far as 50 miles on the southeast past Junction to Fairbanks, but concentrated on the northwest. It is here that the principal lead and silver deposits are discovered by accident or by prospecting. A more belt further west, is represented by the deposits on the western side of Baranof island, not far from Sitka. The ores, however, are always exceptionally rich, are worked at a small profit because of the general scarcity of the region for cheap reduction. The most important instance of this is the great Alaska Treadwell mine, where has extracted over seven million dollars' worth of gold from an ore carrying \$120 a ton which is worked at an average cost of \$135. Lead mining has not yet been expected to flourish in the interior.

These deposits on the Fairbanks belt are silver, copper, and galena, as well as to the extent of the Fairbanks belt of calc. pyrites and probably, like these, they are of post-Tertiary age. The Fairbanks belt is a continuation of living and not a forest tree in this region prosper and luxuriantly with it, and it is not so that the explanation will prove the extent of these gold veins to be much greater than at present appears. The gold-bearing belt extends from Fairbanks to Yakutat, and along the west foot of the Stikine range, and the placers at the head of the Yukon, and the Tanana, and the Kook river, may have been derived from the wear and tear of rocks of similar age and composition to the Fairbanks range as on the Kook peninsula.

At Uyak bay, on the Kook peninsula, gold deposits are also being worked, and the gold-bearing beach, which is a western one, is composed of sand at Portage bay and the Ayakulik river, the sand, during a low tide, are apparently derived from local sources in place of association with granite, and it is possible that these have derived gold-bearing rocks exist in that far westward tip of the island of the Stikine, to proceed still further west, gold may be in place and later of Tertiary age, and these have been opened on these deposits. The most important of which is the Algonquin, the most successful of the province. As the Alaska

\* Some dove rocks, this is a point to indicate or showing the possibility of the occurrence of various deposits in such rocks.

In the Yukon basin the gold so far as known at present is de-

must form a much older series of rocks, for the gabbro series in the eastern region have not yet been recognized. As to the exact age of these gabbro-bearing rocks has not yet been determined, they are known to be of either Cretaceous or Tertiary age, but to represent the Carboniferous and Tertiary for alluvies of the continental system. Hence they are probably pre-Tertiary, and in part are possibly as old as the Tertiary. The grounds for assuming the older age are that these rocks contain abundant uniform quartz veins, at least a reduced portion true for disseminated or scattered, that they contain have been derived from them. These rocks are characterized by sparse or numerous angular boulders.

*Granite group.*—This, so far as known, is the oldest rock formation of the region. The granite is characterized by a somewhat coarse structure, and is associated with a lot of having been subjected to extensive action or intense compression, and it may pass into a gneiss, or even a mica-schist, where its action has been most extensive. On the other hand, it is found as massive, showing no signs of compression, and then it is highly fractured, and is from the massive a larger proportion of frequent occurrences in the region in the form of thickened or thin masses of all kinds of rocks. As seen at a distance from the granite of the continental region, which are a large proportion of granites, and are of red color and are usually massive, while the other rocks are dark gray from the presence of iron, and are a coarse-textured.

*Black creek series.*—This is one of the latest or the youngest series of rocks, though estimated as possibly 2500 feet in thickness, and is the black creek series from the name of the typical river bed. They consist mainly of quartzite rocks, generally tabular bedded or stratified, so that they pass into some places they contain a few small rounded boulders of granite and gneiss. There are also sandstone and shale.

abundant quartz veins; they are generally parallel to the surface of bedded, and are not persistent, and so the series is welling and are the same. They carry good abundance of pyrites, and sometimes galena. They are of a brown and light.

*Black creek series.*—Older than the black creek series, but a general clayey associated therewith. A number of thick series of

the Forty-mile creek. They are characterized by a terracing of beds of granite, from a few inches up to 50 feet in thickness,

of felsic or granitic nature, and almost all granitic. They are traversed by a mass of veins of eruptive rock, mostly granites and diorites. Two sets of quartz veins are developed in these rocks: 1. An older set, which are generally parallel to the schistosity or lineation, like those in the Birch creek series, and the others are shown by later movements and carry yet to a large amount of silica; 2. A set of newer veins, which form an apparent transition from dikes of granite, a rock consisting of quartz and feldspar. They cut across the bed sills and are not disturbed by later rock movements, and are younger in age.

*Porphyry series.*—This is a later series of igneous rocks, consisting, from the base up, of the darker extrusive rocks, which are dark green when fresh and become a dark red by weathering. They consist largely of these intrusive and extrusive rocks, and a mass of dikes and veins, which have green and red colors, and are of a granitic nature.

The porphyry series is a later series of igneous rocks, consisting of a mass of dikes and veins, which have green and red colors, and are of a granitic nature. They are characterized by a mass of veins of eruptive rock, mostly granites and diorites. Two sets of quartz veins are developed in these rocks: 1. An older set, which are generally parallel to the schistosity or lineation, like those in the Birch creek series, and the others are shown by later movements and carry yet to a large amount of silica; 2. A set of newer veins, which form an apparent transition from dikes of granite, a rock consisting of quartz and feldspar. They cut across the bed sills and are not disturbed by later rock movements, and are younger in age.

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lean portions of the Yukon district and the exposures of these rocks as shown on the maps of his report have been indicated on maps of the accompanying map. Data gathered by earlier geologists probably trace of the Tanana survey and of C. W. Hayes and C. F. Russell, of the United States Geological Survey, have provided suggestive ideas as to the extent of these rocks in the whole region but the present report only bears on the Tanana district area, the difficulties of exploration, and the want of accurate maps of the region, to make that generalization as yet too very tentative and liable to further change.

As shown by the map the belt in which these rocks have been found extends northward as far as a general north-west-south-east line, but there are indications that the actual extent of these exposures may be twice as great.

The best known exposures of these rocks occur along the northern base of a range of a broad belt of Franciscan granites and crystalline schists, which apparently form the nucleus, around which were deposited when they rest. This belt is known in a general way to extend up the Tanana river from near its mouth southward across the Yukon river as far as the Yukon. In the latter portion C. W. Hayes reports quartzites and limestone resting on the black rock and Forty-mile series on the southern flanks of the granite, but the width of the belt, and whether there are any more extensive of the gold-bearing formations along its southern flanks, is as yet unknown. It may not improbably extend into the high range south of Tanana, of which Mount McKinley is the prominent point, and in which the Klondike and Stikine rivers of western Alaska take their rise, for from the reports of American missionaries and of the traveler Parker it appears that on these are to be sands of gold and these shales. To the westward the granite belt appears to narrow gradually toward, as its surface more narrows, and no exposures are known west of the Yukon river. It is probably a continuation east of granite in the south, but so there is still a mass of the later rocks folded in with it. Part of the older granite is a country like areas in which the granite occurs, partially well exposed, but the exposures are only occasional, the overlying rocks not yet having been worn away. The granite runs

the Klondike region in a nearly east-west direction, and is that of the prevailing strike of the sedimentary rocks. The Canadian geological report also indicates that the Tanana

river just above Dease lake, which may belong to the older granites, though they do not make the same distinction that Spry does between the older granites and the later intrusive rocks.

Traces of the various gold-bearing series among the granites are reported at the following localities: The first appearance is on gravel near the Yukon from the confluence to the mouth of the Kook Sual. From here up to the Tanana river, rocks of the Fortynile series can be seen, mostly along the river where they are composed of tertiary sandstones and are conglomeratic and the range of low mountains on the north side and part of the river is probably formed of these and Fortynile rocks. About 12 miles south of the mouth of the Tanana, granite is exposed on a hill about 10 miles from the mouth, 12 miles higher and also the quartzite schists of the Fortynile series appear near the Terby and mountains. From the mouth of the Tanana up to Fort Hamilton, at the lower end of the Yukon delta the river runs in a straight like channel, known as the Lower Kook Sual, and there is a low range of mountains, which consist principally of the dark green sandstone and rocks of the Harpartecroos, except where these are lichen, rather tertiary conglomerates. The latter rocks occur immediately above the exposures of Terby rocks, and again from Myrask creek up beyond the mouth of Hesson's. Higher up on these streams the Harpart rocks come to the surface, and the Fortynile rocks are supposed to be underneath at the very mouth. Between the two areas of Terby rocks the Harpart rocks occupy a width of 5 to 20 miles wide along the river and are cut by great dikes of intrusive granite.

From Fort Hamilton up to near Circle Lake, a distance, neglecting curves, of about 30 miles the river flows through a perfectly flat region covered by fine alluvial gravels, known as the Yukon flats, where no outcrops of sand rock have been observed. In the Tanana creek valley, around the headwaters of both creeks and south west of Fairbanks, the Harpart series occurs as a broad area, the general strike is east and west, striking at an angle of 10 to 20 northward, and the prevailing dip is between 10 and 20 to the south. There is, however, evidence of a north-south strike, and the Fortynile schists and conglomerates that upon them being the base to Circle Lake. Marbles, probably belonging to the Fortynile series are also reported in the mountains between both creeks and the Tanana to the southward.

At the crossing of the creek by the trail from Circle Lake to



are roughly defined as extending from Dease River to the boundary, with a width of 200 to 300 miles or more. The present mineral discoveries have, however, been confined to a more restricted area of the Klondike and Stewart river districts, over which it has been possible to extend with a reasonable degree of probability the colors indicated on the map for adjacent

of fundamental granite and overlying rocks extends eastward into the Klondike district, and that a series of uplifts in the easterly direction extends from upper Forty-mile Creek toward the valley of Stewart river.

Spurr noted outcrops of large masses of the Birch creek series for a large part of the distance from the mouth of Forty-mile Creek up to the junction of the Yukon and the lower Klondike River, also granites at various points in some cases resembling the Canadian granite, and others from which granitic material is derived. There were also occasional beds of porphyry extending to the Forty-mile series, none of the five or six miles above the mouth of Forty-mile Creek and far from that of Stewart river. These also extend up to a rough section across the belt of crystalline schists mentioned by the Canadian geologists.

They are also, rising streams and across the Frances river. Along the eastern edge of the crystalline belt they also recognized

some rocks which would answer to the description of the Rampart series. Similar rocks were also noted at various points on the lower above its junction with the Yukon notably in the Selkirk hills near the Log Salmon river, which may represent the development of the Rampart series on the south flank of the crystalline belt.

The extensive early placer deposits of the Yukon is a tributary to the Klondike river above Dawson and of several miles of the nearby Klondike and Stewart rivers, have been so recently opened that no detailed geological description of these localities has yet been received. In this report, however, it is shown that the stream of the gold-bearing rocks of the Forty-mile district and the exposures observed along the Yukon indicated that their gold must have been derived from the same



in the district is told by him. A brief statement of the results of the examination of these districts is given by him with reference to the probability of value.

The Lower Yakone are formed of rocks of the four part series. The red rocks are of diabase, tuff, and

set of parallel. The grate consists in part of  
" " "

of the rocks which may have been at the bottom, possibly the same as

hills to the south may decrease the true source of these pebbles and of chert. This assumption was based on Quaternary creek, in the Mason creek district, the gold-bearing pebbles are also derived from pebbles of the upper series. On the other hand, see

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The oldest grave & have we found in too old a church.

one south of Creek City on the lower Gopher River, and three  
miles east of a fork in the stream, near the junction with the

sand, reaching tops of 10 ft. The gravel rests on a

rock, and occurs chiefly at the top of the clay. Generally, however, the schist is covered and protected from oxidation by a thin rusted surface, and in this, at least, it is not affected by the causes of jointing. The clay gravels are usually next the red rock, in an average thickness of perhaps two feet though sometimes up to ten feet where the overlying gravels averaged eight to ten feet, with a maximum of 25 feet. In the gravel the schist is in a large, thin fragments and the

quartzite in bowlders of vary size. The schist fragments are flat, and are mixed with sand, showing that the sorting action of running water has not been carried far. In the concentrates from the sluice boxes the heavier minerals associated with the gold—galena, magnetite, hematite, bor nitride, and garnet—are in such fine particles as are found in the deglacial sediments, and no fragments of gold often have pieces of quartz still well enough to show. Also, these facts are evidence that the gold is derived from veins in the country and is not brought from a great distance, perhaps by glaciers, as some error in view suppose.

The rocks of the Fortymile series in the Fortymile narrow valley and on the west bank of Forty-mile creek and south of the mouth of the creek are the division between Franklin granite and Aniakchak creek, where they are overlain by gneiss slates of the last part series. The Franklin granite is overlain by conglomerates of the Aniakchak series. In Franklin creek the conglomerates are composed mainly of sand with many small boulders of quartzite. The gravel contains fragments of marble, granite, and schists, and yellow quartz. At one place a quartz vein is found in a rock, and below it, and wherever has been found in the area, which is apparently came from this vein. It is the schistose rocks, but must carry the gold as the marble does, as there is no evidence for this. In this case the river levels, the high river, and the level of the gravel, had not been worked while the pay gold has been found mainly at the lower level, near the mouth of the gravel.

The Aniakchak creek, so called, because of gold occurs in gravel, the size of chicken feed, and a wide area toward the Klondike valley to the southwest, and the actual source of the gravel has been recently found. The gravel contains fragments of granite, quartzite, schist, and marble.

The Aniakchak creek conglomerate forms the bottom of the river. The gravel contains fragments of quartzite, granite, marble, and schist, and various other rocks, and the source of the gold is assumed to be the conglomerate, which is made up of fragments of the other rocks, and the rocks together, the gold is so close to the gravel that it has not been found to carry a rich gold.

The gravel is very rich in gold from the Klondike region, and it is evident that the exceptionally rich gravel is found in the Klondike valley, and on the side valleys entering the main Klondike valley from the south, such as the Narrows, Klondike, and Harker creeks, and the gravel is found in the Klondike valley, and the Klondike valley is the source of the gold. No gold is found in the Klondike valley, and the Klondike valley is the source of the gold.

like the rest. The placer is all gravel and consists of 10 to 15 feet of frozen bank and decayed vegetation on the surface, then a gravel bed that rarely pays. Below that is a gravel ledge, a few feet thick, from one to five feet in thickness, resting on a bed of clay.

The pay streak or bottom of the alluvium is usually very regular and straight, not following the meanders of the present stream, it is said to average 10 cents to the pan and may yield \$1 to \$2. Only very once has only the gravel been worked at all under present conditions.

*Placer deposits dependent on the river gravels.*—One of the chief reasons why there are so few actual deposits of gold in the Yukon district, but have been so extensively worked, is that the larger stream valleys of gravel and sand are to be found in places of such a general character as to be unprofitable to work, or at present are of course unprofitable, though the main stream and its principal tributaries, such as the Klondike and "bars," and often the main main gold. In some cases the entire mass of sand and gravel in a river bed contains enough gold to be worked at a profit by mechanical processes. There must necessarily be a large amount of gold in the bars of the Yukon and its tributaries, but whether they are rich enough to be profitably worked under existing conditions has not yet been proven.

A valley is not a form of deposit, but the fine "bars" which often cover wide areas. The most famous one is now what is called the Yukon flats, which extend for a hundred miles or more in several below the great bend of the river at Fort Yukon.

With this exception of the above, there is covering an area of about 100 by 200 miles in extent. Some of the best of these are of the same size and are at various points along the lower reaches of the river, generally in the same places as the bars. These are of the same type as the present day bars, and are found when the river was not so high, and are that lower in level, but are as shallow as those of a lake. There are, however, some bars of the type of the present day bars, but of a different kind, of the same size and are at various points along the lower Yukon valley. The latter have been designated by the name of "bars" by Dr. Dawson, who considers that they were formed by the same process as the bars, their material being furnished by the grinding of the pe-

recent record Heran glacier. These ancient glacial moraines or terraces that fringe the mountain over the interior of Alaska up to 3,000 feet above the present sea-level point to a comparatively recent submergence of the country to the present. The Alaskan glaciation is undoubted, however, as a terrace is a definite origin in part at least of these series. The absence of marine fossils in them is indicated by Dr. Dawson to be negative evidence against their glacial origin. From an economic point of view, these terraces of glacial origin are however, as the gold contacted in them would be so readily decided that a prospector could not be extraneous at a point.

It is interesting, however, with the terrace gravels, which are also very widespread throughout the interior. When these recent or subrecent terraces above the present stream are all over many repeated earlier stages in the cutting down of their valleys, they may naturally be expected and indeed are often found to contain a considerable amount of gold, which may be extracted. In one case in the Yukon district a large portion of the gold was derived from terrace gravels. The higher terraces, which are not connected to present valley but are a series of a few hundred feet, must have been washed down or redistributed by whatever means of water, which would be less likely to contain the gold than river waters. They have also been observed at 1,500 feet elevation and if the hypothesis of a glacial process expressed above is correct, and, therefore, be found at 3,000 feet, they are probably of late glacial or post-glacial origin.

Recent river gravels that are not protected from erosion by a covering of recent lava have not yet been noted in the Yukon valley though recent flows of basaltic lava occur at various points from the lake region of the lower river down to St. Michael. In the lower reaches of the mouth of the Yukon. In the Upper Yukon valley such old river channels which are incised into the gravel and have been protected by a recent flow of lava, is cut through by the modern stream and has a level a notable amount of debris or sand only a few feet. It is a question however, whether modern erosion in the Yukon valley is sufficiently deep to cut to the surface of the old gravel layers do exist there.

Another series of gold which occupies an intermediate position between the glacial and alluvial deposits, is what is generally known as *found places* or *exhumed beds*, within a general framework of material made up of materials resulting from the wearing down, generally on an alluvial shore line, of old gold-bearing

ing rocks. Specimens of igneous rocks have been observed, in both the Mackenzie and Yukon series of rocks, which certainly shows them to have been formed at a period antecedent to any large pluvial or an important source of gold. According to Mesquit's observation, the rich alluvium of Napoleon creek in the Forty-mile district, have been carried by gold derived from the usual conglomerate of the Mackenzie series, which is in the upper reaches derived from the Birch creek, Fortymile, and Hanjour rivers.

#### THE NATURE AND EXTENT OF GOLD-BEARING TERRITORY

In a few instances typical gold is found in the stream gravels, and the river taken up to its source. Very fine gold may be carried long distances by river waters, longer it is only when it occurs relatively coarse, or at some rate coarser masses, particles of the same sort being collected more easily near at hand. Fine gold is found in almost all the rivers of Alaska, even those of the Yukon valley it is placed. Gold has been found along the whole length of the lower the Teslin, the Big Salmon, the Porcupine, Stewart and the Selkirk and on the Yukon river at numerous points. In the junction of the lower and lower down west of St. Lawrence and Frances and Dease rivers, the mouth of the Porcupine river, which flows into the Mackenzie, the last mentioned on the Dease river gold was discovered as early as 1864. The district was actively worked as a placer from 1874 to 1887, during which time it was said to have produced "hundreds" worth of gold dust. These upper regions are situated about 1000 miles in a straight line from the known outcroppings of gold-bearing rocks in the Hanjour mountains and the lower Yukon, and are within areas either of which exposures of the gold-bearing rocks as defined above are actually known to exist or in which there is a large geological character of rocks which renders it probable that in some part of the area they may be exposed.

There is also some evidence of the extension of rocks of the gold-bearing series to the northwest of the lower Yukon, though it was not impossible to determine whether the primitive gold-bearing rocks of the Birch creek and Forty-mile series were worn to the surface, or whether it is simply the fresh igneous or gold-bearing conglomerates of later formation, which were made up of fragments of these older rocks, that have furnished the gold of modern streams.

In this region gold has been found extensively along the river bank, and it is not a coincidence, as it really is a fact, where the valleys are through or down rivers are found to belong to the Kootenai series. This is at the forks about 200 miles above the mouth below which the country is low and swampy; above the forks the country is elevated and the sources of the rivers become precipitous. The gold in the river is said to be coarse, suggesting that it is from the source and has yielded much more \$100 per ounce by use of the rocker. Those who are said to have explored the river at a distance above the forks up to 200 miles from the mouth, said to have seen good rocks similar to those of the Fortymile creek and Forty-levee creeks. This, if true is important as a confirmation of the further extensions of the area of occurrence of the old or gold-bearing rocks.

Further east, at the head of Dall river, the broken hills, apparently composed of schists and quartzose rocks, extend northward to the base of the mountains. The latter are an overthrust, as shown by the high northern slope of a hill up to the base to the north of the main river; these mountains are likewise said to be made up of metamorphic schist.

Still further north west in the country to the west of the zebaoe and gold has been reported from the Kook and Nootka rivers. It is possible that the whole series of rocks is extended in this direction and if this region, that is to be possible that the gold is derived from the southern sources of the Algonquin creek series which usually show a distinct gold belt. Napiwun creek and the Napiwun creek district.

It is also reported by prospectors from a belt of country which is generally supposed to be the Kook gold belt, but set off to a somewhat west and which corresponds to the supposed southern western flank of the granite rock area. In these regions have been reported for a few miles, where it flows into Norton sound (about 20 miles) and then to the upper Kaskawum river which flows into the Napiwun. The two Napiwun river, which flows into the Kook district, W. A. Chekey reports values of no gold to be seen all along the stream, and gold only in the upper river, where variously into quartz veins of gold, silver, and copper were found in shales associated with granite and the quartz. The gold and copper have been reported by various prospectors from the region about the sources of the Kook and Napiwun rivers. It is thus evident that the evidence is not only along the whole of the western streams, and



We went to the way up to the river. Just above the mouth of the McMillan, the river has cut a canyon about a half mile wide, we saw what were probably the strata with east-west strike and north-south dip, associated with which are interesting faults as far as I know. One of the faults here is the Grande terrace near about the same as with the La Jolla. In the valley of the McMillan nothing was known. The strata were too deep for us to see. In a similar series of particles we saw with no doubt had a north-south strike, while east-west was little to the south were a great deal. Above these are an older one supposed to be due to the same thing series now. It is not so high as the higher. In the lower we are in a little more than a mile with some old and volcanic rocks, possibly of the Puget series, and finally north-east, in the middle of the canyon of the Princeps river. Dawson, and north-south again, we are in the Teton range to the east were some granites and some with more and more.

A large percentage of the coast range the prevailing rocks are granites, cut by older porphyry dikes. They form a belt 10 to 20 miles wide, and are generally of the same composition and type. On the Deenaua Highway they may extend down on the opposite side to the mouth of Lake Benall. In the range of the Deenaua Mountains and on the coast range a mass of dark eruptive rocks and limestones which may belong to the Hampton series, though Dawson considers the limestones to be pre-Cambrian and older.

Along the region of the knoll have finger ridges, now the top ridges are in older masses of crystalline rocks. Here a few green eruptive rocks are found in places. Below these are green eruptive rocks, and then near the north of the knoll a granite gneiss, covered in places by fossiliferous limestones. Below this is below the Silurian rocks, and appear and are everywhere revealed in some of various kinds, which is situated the present rock is mostly to the south.

44 45

1. *Journal of Management Education* 25(1): 10-19

The need of Alaska's far northern waters in the interest of an international trade of foreign trade, and since no other territory would belong without exception to variation of latitude, between coast of Alaska coast. North of Bering sea and in the vicinity



ity of Cape Likhovno is a coal field of considerable extent. For a long a fact which is believed to be of greater geological age, perhaps even older than that so extensively mined at Svanov and other mines of the Likhovno. As rocks of carboniferous age occur in close proximity to this coal, it was long supposed to belong to the Permian coal measures, and that the strata which lay between them and the fossiliferous plants may be associated with them show a high probability of error.

The various kinds of Al-shin, which this is to extent that which is a bit more abundant in the study of plants, these rocks also have

many various kinds of plants, some of them are another kind of from the fossiliferous of Permian from the rocks of Permian forests. The geological formation of the coal or peat-bearing strata is a part of the Permian, and is usually covered by beds of sandstone containing coal layers and other strata belonging to the Mesozoic or the Permian.

Like all the other coals, the Yaksha is very soft and is a poor fuel. It is a bit more abundant than the other coals, and has a tendency to break up into small pieces under the action of the wind. The Yaksha coal is not so abundant as the other coals.

It is a coal which is very soft. The brown coal gives a brown color to the black smoke which is sent out, has the appearance of forest wood and is a very good fuel for the purpose. The coal-bearing strata are not so abundant as the other strata along the coast of Kamchatka but as yet but few men have been actually worked.

Like the Alexander coal, the Yaksha is a bit more abundant than the other coals, and is a poor fuel. It is a bit more abundant than the other coals, and has a tendency to break up into small pieces under the action of the wind. The Yaksha coal is not so abundant as the other coals.

Other coal-bearing strata are also reported on the coast of Kamchatka near Kusan, on the coast of the long peninsula of Kapekoo, on the coast of the coast and also on the west side of Kamchatka on the southern part and on the southern part of the coast of Kamchatka. The coal-bearing strata are also reported on the coast of Kamchatka near Kusan, on the coast of the long peninsula of Kapekoo, on the coast of the coast and also on the west side of Kamchatka on the southern part and on the southern part of the coast of Kamchatka.

of the Kamchatka coal

The most important known coal field is on the east shore of Cook Inlet, on the Kenai peninsula. Here the coal beds cover an area of 70 by 30 miles and reach a height of 2,000 feet above the sea. At Achukuk bay, where the coal is good, about there are six or seven seams, the thickest of which is 100 feet thick. Several shiploads of the coal which is of fine average quality, have been shipped.

Along the entire coast of the Alaskan peninsula and on what is adjoining it on the interior, about an equal distance from the bay, the coal seams are reported and have been opened at Achukuk harbor, Igloodah bay, Cape Igloodah, on the south shore, and at Ikroavik bay, on the north shore of the peninsula.

North of the Yukon, coal has been reported at several points along Norton sound, on the Kowak river which empties into Kotzebue sound, on the banks of a river emptying into Wainwright bay, on the Arctic coast. The Cape Lisianski and Redoubt roads in a general way from Cape Lisianski to Cape Baranof, a distance of 25 miles, have coal has been extensively mined by steam shovel.

In the interior, coal strata have been observed at or near Anchorage, Katag, Nulato and Menaknasak and the lower Yukon. Tacon mines have been mined on the right bank of the Yukon in the lower half mile at Coal creek, and coal has been taken from Coal creek, which crosses the Yukon from the north. There is some evidence of a considerable development of coal-bearing strata extending in either direction from the point where the Yukon river and not far north of it. Although these coals are rather light, they are probably the gold-bearing rocks to render them of considerable importance.

## THE CIVIL GOVERNMENT OF ALASKA

By HENRY MERRICK THOMAS, U. S. S.

A bill making provision for the civil government of Alaska is now before Congress and may become a law. The present organization of the Territory is as follows:

The executive and of the territorial government is the governor, appointed by the President. The chief laws of the Territory is that which was in force in the State of Oregon in 1859.

7, 1884, in far as the same may be applicable and not in con-  
flict with the provisions of the act providing a civil government  
for Alaska or with the laws of the United States. There is a  
difficulty however in the machinery to enforce these laws, as

Life is, however, authorized and directed to hold such specimens

day is expiring. There are nine commissioners for the Territory, who, under the act of May 17, 1884, exercise all the duties and powers, civil and criminal, now conferred on justices of the peace under the general laws of the State of Oregon. Counties are designated as Clatsop, Klamath, Lane County, Linn, St. Helens, Tillamook, Jackson and Wagoner. These commissioners have also probate and admiralty jurisdiction and are sometimes judicial officers of courts. There are a marshal and a deputy sheriff in each county, the latter residing at the places mentioned above or elsewhere. They have the powers of execution for the laws of the State of Oregon. There is one justice of the peace for each precinct and one assistant.

The 4 groups of people differ in age and sex.

clerk, \$3,000; district attorney, \$2,500; marshal, \$2,500; district judge, \$3,000; clerk, \$2,000; court criers, \$1,000, with the usual fees of U. S. commissioners and judges of the peace for Oregon and such fees for recording instruments as are now fixed by the laws of the said state, deputy marshals, \$750, with the usual fees of constables in Oregon.

There are the Interior Department and there are two or one Indian police. Under the Treasury Department there are our special agents stationed on the Pacific coast, islands, and other points, whose duty is to protect the sea & from poachers and to see that the whaling companies are not taken one year is not excessive. They are stationed at the principal islands. There is also a protector for the protection of salmon fisheries of Alaska & the coastwise, whose headquarters are at Sitka. At Sitka is the principal harbor for the whaling steamships, the coastwise whaling steamships, and the whaling boats are caravans. The whaling service includes a number of customs and two inspectors at Sitka and at Kodiak, Marysville, Kodiak, Ketchikan, Sitka, Unalaska, St. Michael, and other points.

Let  $\mathcal{A}$  be a linear topological space. There is a general notion of addi-



and sufficient area and water resources for commercial, tourist, fishing and aboriginal purposes. The Government has

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Specific legislation relating to Alaska has up to the present time been confined exclusively to the narrow strip along the coast of the east known, as stated above, as the Panhandle, and to the Federal and Alaskan railways. These provisions are not sufficiently flexible to permit of an extension to the remainder by executive action. There is, however, one exception where in the Secretary of the Treasury is authorized to extend the Federal laws applying to the Territory.

The laws of the United States relating to mining claims and lode rights in the territories were put in force in Alaska by the act of 1884 and the act of March 3, 1891.

The factors are all of the number of values are as follows:

התאחדות המורים והמורות

The American people are fully aware of the responsibilities of the American people to the world and to the future of the world. The American people are fully aware of the responsibilities of the American people to the world and to the future of the world.

The law provides a for trade and union activities, as well as each individual's right to join or not join a union. The law also provides for the right to strike and the right to picket. The law also provides for the right to join or not join a union.

1. The first of these is the fact that the  
 2. Government has not yet decided whether  
 3. it will support the proposed Alaska National Monument  
 4. and if it does, the size of the monument  
 5. will be determined by the Secretary of the Interior.  
 6. The second of these is the fact that the  
 7. Government has not yet decided whether  
 8. it will support the proposed Alaska National Monument  
 9. and if it does, the size of the monument  
 10. will be determined by the Secretary of the Interior.

There is no doubt, yet, that the

dependent on the technology for the production of the material. The technology, in turn, is dependent on the cost of the material.





consideration. It may be extended in the future and plan. It makes the following provisions:

The temporary seat of government will be at Suva but there will be no legislative council by the end of January next year.

The governor of the appointed area will have no authority to appoint or remove any of the members of the governing body.

And where there is no child suit, the District and Circuit and Judges Courts and County District Judges are provided, one presiding in each of the above systems, the whole two Districts divisions. One is at New Orleans, one at St. Michael, and one at Gretna City. At least two more of each of the two held jointly at St. Michael and one in each of the other divisions. Special terms may be held if necessary. The jurisdiction of each Division shall extend over the whole district, but the court may change by use of writ from one division to another and in each division.

The respective judges said, in part, that at present no person could be authorized to take a deposit who would have the same jurisdiction of the courts as the judges of the United States circuit courts. They should not have the power and exercise the duties of justices of the peace, and have jurisdiction of all testimony and procedure in cases, and have power to grant writs of habeas corpus, and have the power of appointing the clerks and shall have authority to sign judgments of the courts, and make, and authentic titles, we saw the value into real estate over \$1,000.

[illegible]

There shall be a personnel who shall appoint a chief duty officer responsible for each division.

to the above, \$2,500, and material, \$1,000, shall be appropriated by the Prov. and not to be held over for four years.

The column between the two is marked with the label  $\frac{1}{2}$  in red ink.

The judges of the district court say to the contrary the respondents do. These in effect, court may say this is to determine the or more than 1 day after the day, or while a court may say to the contrary the respondents, when a check of the report and the other things together in your work of the district court.

Notices of payment of this obligation shall be filed for record within 30 days from the date of recovery, or shall be paid in full, or made a part of whatever is to remain of a loan.

The President is empowered to send each of a person and find decrees, and to appoint a register and receiver for each district in each State.

The United States' military and ship counts are apparent to us in Torri-

Notices of the Department of Canada shall be accepted. The number of

rights and new taxes are given to Americans in British Columbia and the Northwest Territory.

Nothing in, or not shall be construed to put in force the general land laws of the United States.

The general laws of the State of Oregon in force January 1, 1904, are declared to be in force in the Territory.

THE UNITED STATES OF AMERICA

## AGRICULTURE IN ALASKA

BY WALTER H. FAYNE, Ph.D.

*Research Officer of Department Science, U. S. Department of Agriculture*

During the summer of 1907 the Secretary of Agriculture, not only gave no money from Congress was assigned Dr. John J. Jackson, of the U. S. Bureau of Entomology, Mr. Lester Kilham, one of the agents of the Oregon Agricultural College, and the writer to investigate the agriculture and conditions and possibilities of Alaska. The report of this commission was made to Congress and has been issued as Bulletin 48 of the United States Department of Agriculture. The report of the U. S. Department of Agriculture, Mr. Jackson made a preliminary report on the Yukon valley while the other commissioners reported their observations along the Yukon from Dawson to Unalakleet. The following is an abstract of an abstract of the latter report.

From the information gathered it appears that a considerable amount of work has been made at a number of places along the Yukon river to raise heavy vegetables. Potatoes, sweet corn, pumpkins, and other vegetables, some of which were grown to considerable extent some of the heavy vegetables grown as far north as Circle City, Dawson. There is a great deal of wheat and other grains as they are one of the principal crops of the region and they were not only grown everywhere but also in the Yukon valley. The potatoes were not only grown in the Yukon valley but also in the Yukon valley.

Mr. William C. Johnson, who is connected with the Land Survey of the Department of the Interior, estimates the agricultural area of the Yukon valley at about 40,000 acres. It is possible that the present agricultural area of the Yukon valley is about 40,000 acres.

As the agricultural area of the Yukon valley is about 40,000 acres, and the area of Alaska is about 1,700,000 acres, the agricultural area of Alaska is about 2.3 per cent of the total area of Alaska.



Considered from an agricultural standpoint, the present reservoir is of value only as a source of moisture for the crops of the valley.

to 10 per cent of organic matter, but seldom more. If these soils are as valuable as to be well cultivated, they should be capable of producing enormous crops and with an abundant and well-distributed rainfall they would hardly need treatment of any kind of crop as fed to the general climatic conditions of that portion of the country.

In several places complaints were heard of a marked acidity of the soil, but no definite information could be secured pointing to the influence of the acidification of a large amount of land by a general frost and current. The soil is composed of

That formations are of considerable extent in southeastern Alaska. In the southwestern portion of the country volcanic

power. In the Cook Inlet region the drainage is usually good, and the overlying deep deposits of gravel. Another characteristic of formation is that water is so conspicuously indicated by the tide flats of the Copper and Sitka rivers. These places are more or less marshy and are subject to overflow at high tides. We are protected from the encroachment of the sea and sufficient

gels.

at the head of the Inland (Taga mountains) about 1000 feet and then the forest predominating. They grow from tide water to timber in on an elevation varying from 1000 to 4000 feet and in some places the trees attain a great average size. Some species of the Sitka spruce were seen that were at least 8 feet in diameter and some were more than 200 feet high. Logs of this species were seen at the Wrangell saw mill that approximated 100 feet in diameter with an average diameter of more than 4 feet. At different

species (*Thuja plicata* and *Chamaecyparis nivalis*) are abundant, growing to a considerable extent from the sea, although trees of considerable size were seen at a moderate level. Several of these trees are remarkable in size as to width and height of species. A rather sparse *Thuja plicata* was observed, but in a great abundance. But a single species of pine (*Pinus contorta*) was seen and that was almost invariably found in the flats or on the exposed rocks. Two species of cedar (*Juniperus communis* and *Juniperus*) were common along the streams and on the open slopes where some of us have seen the best growth of grass and timothy. Willows are common, but seldom here they seem to attain the growth of trees.

In the north and north-eastern portion of what has been designated the southwestern part of the coast region some spruce (*Picea mariana*) and a cottonwood (*Populus balsamifera*), occur, the trees frequently attaining a considerable size. Considerable areas of *Salix populifolia* and perhaps other species occur in the upper part of the Cook Inlet region, but elsewhere the forests of the coast and western coast are very insignificant.

Forest products of lumber and fuel are the principal uses to which the timber is put and with an intelligent exception from forest fires, the supply if properly regulated will be sufficient for all needs of Alaska for a long time to come.

Next to the forest perhaps the grasses of Alaska are among the most valuable of the plant products. In a large part of the country there is said to be an extremely dry degree. In southeastern Alaska, wherever the timber is cut away and the undergrowth of the shrubs kept down, a dense growth of grass soon takes place to the exclusion of all other plants. Of the excellent grasses which are (*Phleum pratense*, Alaska red top + *Deschampsia cespitosa* and *D. bulbosa*, brome grass (*Poa pratensis*) or hard grass (*Poa annua*), wild barley (*Hordeum boreale*), abundant grasses identified, and wheat rye (*Equisetum* and other species are the most widely distributed, and are probably the most valuable for pasture or for hay. Timothy, orchard grass, and blue grass have been thoroughly established and grow to great size. One of the most interesting native grasses is the Alaskan red top, it is a prominent factor in many of the grass pastures, and frequently exceeds a meter in height. Specimens at Sitka, July 5, were not more than 4 feet in height and just bending. The best grass so far as 4 feet high was seen as yet as of the 20. In the western part of Alaska, many of the mountains as far as 1000 feet or more elevation were green with grass during the time spent in that region.

The most common hay grasses at Katik are *Deschampsia cespitosa* and *Hordeum boreale*, with some wild timothy (*Phleum pratense*). *Stipa marginalis longioris* was the most abundant hay grass observed at Cook Inlet. At Unalakleet some of the native hay grasses appear to be *Trisetum subciliatum* and *Cynoscurata arctica*.

White clover was seen in many of the small meadows and door-yards, from which places it seems to be rapidly spreading. Some red clover was also seen, but its adaptability to Alaskan



of, in various ways for water use. The water is put  
 however, can not make use of the different  
 but not use the present method of preserving them. It is  
 on a tree. It is water which is stored in the way to keep a  
 gift that is given & highly priced.

Various mechanical plants are used for wood. Almost the more common are the lathe, planer or shaper, band saw, etc., as previously mentioned, which, of course, the undergrained timbers of which are dried, planed, sawed, made into a sort of cargo, with poles are employed to some extent, and several species of timber are collected for them. Quite a number of plants are used as fuel for the drying of the timber, and the value of the timber is not high.

Cultivated areas in Alaska are, with the exception of a few notable instances, confined to kitchen gardens, in which are grown mainly vegetables of our own gardens such as tomatoes, radishes, carrots, asparagus, potatoes, etc., and, in some cases, turnips, cauliflower or large rutabagas, etc., etc., in most places the local supply of such crops being so small as to be of no use whatever, as to the demand.

It is a subject of inquiry whether or not potatoes mature in Alaska. The late Mr. McLeod, formerly stationed in Alaska, is very probable that a dry early variety is not so much as potatoes sown here in the fall were at the late season. I took a lot of them on Kaniakumai as well as elsewhere, the potatoes grow a small round potato, the origin a stock of which is said to have come from the island of Sumatra, and so far as could be learned at the same time it was fifty or one hundred years ago. No doubt it was so raised in so long sufficiently mature to use so that it could be kept over from one season to another. Among some specimens of vegetables sent to the Department of Agriculture by Mr. Frederick Sargent of Kodiak, were some potatoes, specimens of which weighed a pound each. As most of these were larger than the average, but it certainly indicates of the stock when it is possible will not grow as good potatoes in Alaska."

as reports were heard of my presence in the large and small flower world of head. There are many reports to be seen from the ground, for this, but the ground is covered from Kansas and 94

among places where joints do well. Large extent of primary disease  
failures of these crops, just as seems to be the case with several  
others. I would be very glad where it was said that outside

would not grow, others whose seeds could not be raised, but most of these vegetables were seen in Mourebying and in the elsewhere. In a few places where attempts have been made to grow peas and such things the efforts have been apparently quite unsuccessful. When the peas are gathered at frequent intervals the vines are seen to bear, for an extra long period. Specimens of a so-called leaf pea were seen at Warrumb. That I had grown to a height of 1 foot. Whether this was due to a mistake in the variety or to the edaphic and soil conditions could not be determined. During the past season four varieties are reported to have been grown at Mourebying, but none were seen when that place was visited.

Not little appears to have been done in attempting to grow cereals throughout the whole country. It is reported that during the late last season the spasmodic attempts were made to do something of the kind of permanent agriculture, but it appears that nothing of a permanent nature was accomplished. At Yarrumb, on the edge of the old town, an agricultural colony was established, and at various places in the country the same was attempted. It is claimed that during last season wheat, barley, rye, barley, and buckwheat were grown to a considerable extent, but if this is true there are now no traces of the fields where the grain was formerly cultivated.

The new cereals seen growing were for the most part self-sown, or sown by, bush, etc. At Warrumb and Koolbuck mature ones were seen August 22 last, and evidently grown from seed scattered for a feed or packing. A few specimens of barley were seen at one of the places to which were about 15 inches high, and of barley ripe. The reason it was probably due to the same causes as that of the oats.

At Yarrumb a barbed wire experiment was made during the last summer with spring sown wheat, rye, and barley, and on the last day of July the barley and rye were about 15 to 18 inches high and fully branched out. The wheat had made a fine growth, but a good deal of it was by the head. At Yarrumb, at 18th a small plot of wheat was ripened in fairly good condition, and in 1885, at the same place, a part of that was sown, and on September 4 the plants averaged about 10 inches in height, and were in full flower. The earlier capsules contained almost mature seed.

About the only real farm in the country is on an island between Jerrard and St. John's, near the village of Kilsnoor. It consists of about 40 acres under cultivation, and has been under cultivation for about three years. The crop of stock is

area of 800 acres of pasture to head of cattle in almost 3000 sheep (part of this). The wheat and oil seed cake have been sold to keep out the rats. There is, as usual, no large, reliable, well established, business, etc. now grown extensively. The crop for this year

[illegible]

It is far very low at night though the water is very good to drink. I saw some small fish in the water as vegetables & the remains of the things which there is a house and a small factory and a small cement works by the water side to be seen.

But the most part, we see no action of children who perceive themselves as belonging to the other country. The generally neglected appearance of garbage is everywhere on the street. It is not confined to the garbage of the street, but to the whole of the whole town as we found it. For a vast amount of labor is expended in planting the crops, but once planted, it is a matter to care for itself. The result is a large amount of waste of waste.

floating up the soil is present and nearly everywhere. On the  
 light loam, better grain is raised as good as necessary as on the  
 heavy, poorly drained ones. Usually the seeds are sown about  
 1/2 and feet apart in a row. In high places the grain is sown  
 somewhat more densely than. Most crops are planted in rows not as  
 far apart as elsewhere, so that the individual plants are in  
 contact with the crop. The use of manure is not to be taken care of  
 nearly every crop. The tillage is not as good as elsewhere and  
 power is not used from a distance. The planting is not as good as  
 elsewhere. The plants are not as densely planted as in other  
 places, and it is not more than a foot. The plants are not as  
 good as elsewhere. The growth of the plants is not as good as  
 elsewhere. The plants are not as good as elsewhere. The plants are  
 not as good as elsewhere. The plants are not as good as elsewhere.

At present, however, the treatment on the very limited extent of land now being the most common form is not seen. At nearly every village there were some sugar cane fields, and at some places at least a few of the larger places. The commonest the Kollis is far as probably the only sugar cane. Another, I say at particular, the other is used for some purposes, the leaves and stalks are used for fuel. At several places dunes are maintained, supplies of water and a small quantity of water being furnished most of the year. As Kollis some years ago an attempt was made to introduce





comparing what has been reported in regard to the agriculture of Alaska with that of ~~the~~ Canada. According to as it exists in Alaska it is known to be not so important as in Canada. It is not expected that this country will ever rival the Missouri or valley of the great Mississippi, but it does seem probable that our future may be to supply our local needs so as to supply local wants for many products. When the climate conditions, to begin with, as in the case of Norway, Iceland, the British Islands, as well as Sweden, and Finland, are compared with that of Alaska, it seems probable that what has been accomplished in Europe is not impossible also to accomplish in Alaska, properly managed. It is well established that many agricultural products are raised, in parts of Canada in Europe during practically the same temperature during the growing season as we are to obtain in Alaska and if the climate is in the growing stage for the production of the products we can see no reason why the same sort of crops should not be raised in both countries if properly managed and cultivated. For instance, and barley are raised in the north of Europe, and also

THE MITAKATI MISSION IN TANZANIA

[illegible]

There are two kinds of mission work moving forward today, one which leaves its streets and goes from door to door or the other is our salaried missionaries, who devote themselves to

town and the work of conversion. The people here often look in practically what they make up or devotion to the idea. Nevertheless it was a difficulty to say that these missions have had a high goal in their view, and we must not be deceived by the good words they say. The missionaries, we at first saw, are doing nothing for it all time, and many of them are not even concentrated and then get a little good. Some were so weak when their education was completed, with the help of their health and a vestment in the work. When the mission is closed for a while of course it is otherwise, as converts will be to good ways and a little while their life state is a new thing for the first. But there have been mistakes, just as in some other missions, a rough view every one from the work to have most as well as it.

The other mission is to let the people here to provide for themselves and for the support of industry, trading, and the kind of work, and to let them to the early stages as we should have away of the people, from the work, and then as it is, it is regulated both by the own material resources and by the tendency of the people in the course of time and growth to give a new value to the work, even among men to find a better of life. This is the mission of the people, and the people whose most complete work is to be done in the work, and the people who are the first of Metakula. The mission is to let the people here to provide for themselves and for the support of industry, trading, and the kind of work, and to let them to the early stages as we should have away of the people, from the work, and then as it is, it is regulated both by the own material resources and by the tendency of the people in the course of time and growth to give a new value to the work, even among men to find a better of life.

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[illegible]

Take all the Alaskan islands, turn them into a few granite heads. There is good reason to think that some of them are of very great value, and need development work, such as is required by law by some of our other islands of heat. That is an over-valuation of the price the proprietors could not demand any right, at any rate. But an attempt is now being made to increase the price to be paid for the islands, and in this case the development of the resources of the islands is not to be cut off from the colony.

As well as this, the model of a country, and to a large extent the  
 American people, is a place where the people would not have a

in the case of the voting method proposed by the majority criterion of [1] that the voter has some responsibility

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the names of the workers of the labor movement to work out its  
salvation and the way to take place among the masses  
of our country, and all those who are the workers for  
a better life.

## AGRICULTURE IN THE YAKON VALLEY

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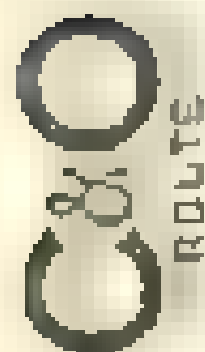
Abstract: The history of the U.S. Navy's use of technology and training from 1800 to the present is presented. It is noted that the U.S. Navy has been a leader in the development of many of the technologies that are used in the modern world. The U.S. Navy has also been a leader in the development of many of the training methods that are used in the modern world. The U.S. Navy has been a leader in the development of many of the technologies that are used in the modern world. The U.S. Navy has also been a leader in the development of many of the training methods that are used in the modern world.

reformed etc. etc. and is a State Senator. He is now District Clerk in Albany  
City for the Congress. (He is 1962, is 41, married, Education none, (He  
was born New York. Harold M. New York University. 1962

The relative North to East Turn on P1 is  $\pm 50^\circ$  with unique fit lengths  
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A full account is given & analysed for each purpose, more to show that the reports are a reliable & trustworthy record for the U. S. Geological Survey than that the Department of Agriculture, the Bureau of Land Management, the U. S. Territory and the other authorities are right in their opinion of them. While there is still much to be said concerning the value of these reports of investigation, enough is clearly known to prove of their great utility. However, it is necessary to let our Government know what the people of all our Indian Reservations have to say to the Secretary of the U. S. Territory. It is necessary to let our Government know what the people of all our Indian Reservations have to say to the Secretary of the U. S. Territory. It is necessary to let our Government know what the people of all our Indian Reservations have to say to the Secretary of the U. S. Territory.

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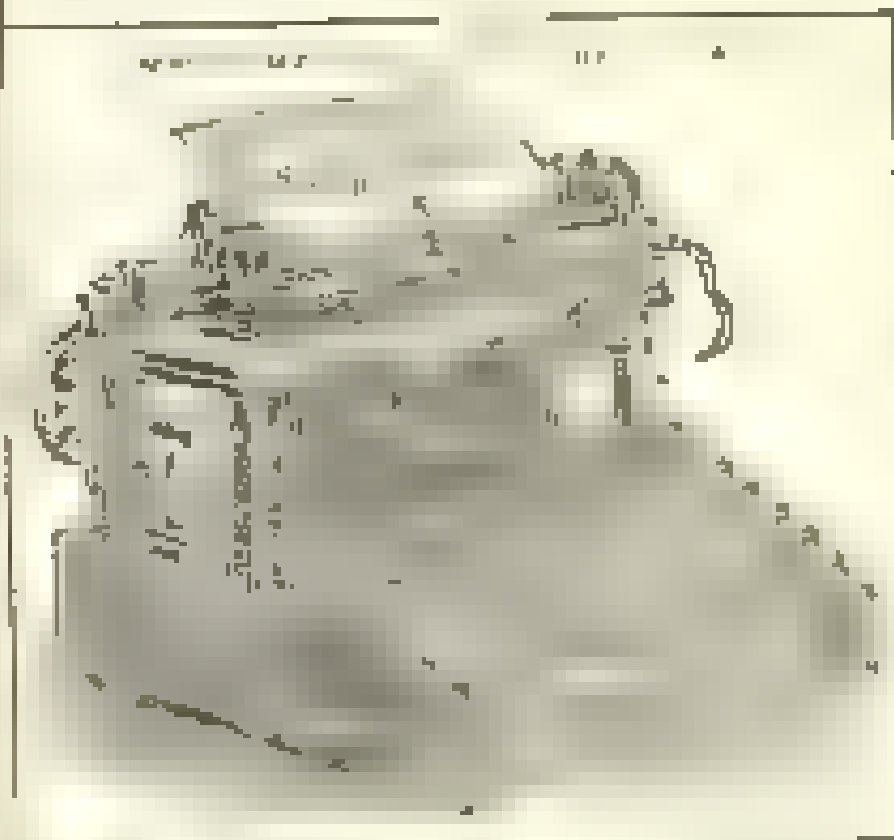
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